

JAPANESE [JP,09-097221,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS
CORRECTION OR AMENDMENT

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1] It has by the program information possible [high order equipment and / phase direction] and sent from the equipment of said high order. A transmitting means to be the information processor which updates an own program and to transmit an own model and the information about a function to high order equipment according to the predetermined demand from said high order equipment, The information processor characterized by having the storage maintenance means which carries out storage maintenance of the program information concerned when program information is received from said high order equipment after transmitting the model of said self, and the information about a function with this transmitting means.

[Claim 2] Said transmitting means is an information processor given in the 1st term of a claim further characterized by transmitting the version information of an own program.

[Claim 3] It has by the program information possible [high order equipment and / phase direction] and sent from the equipment of said high order. The transmitting process which is the control approach of the information processor which updates an own program, and transmits an own model and the information about a function to high order equipment according to the predetermined demand from said high order equipment, The control approach of the information processor characterized by having the storage maintenance process which carries out storage maintenance of the program information concerned when program information is received from said high order equipment after transmitting according to this transmitting process.

[Claim 4] Said transmitting process is the control approach of an information processor given in the 3rd term of a claim further characterized by transmitting the version information of an own program.

[Claim 5] A recognition means to be the information processor which the electronic equipment connected to low order and the phase direction communication link are possible, and manages the program information in low-ranking electronic equipment, and to recognize the model and function of electronic equipment which were connected to said low order, The recognition result of this recognition means, and a decision means to judge whether the object of a program which it transmits and has is in agreement, The information processor characterized by transmitting said program information to low-ranking electronic equipment, and having the means which carries out storage maintenance when it is judged that it is in agreement with this decision means.

[Claim 6] Said recognition means is an information processor given in the 5th term of a claim characterized by recognizing further the version information of the program in the electronic equipment connected to low order.

[Claim 7] The recognition process which is the control approach of an information processor of the electronic equipment connected to low order and the phase direction communication link being possible, and managing the program information in low-ranking electronic equipment, and recognizes the model and function of electronic equipment which were connected to said low order, The recognition result of this recognition process, and the decision process which judges whether the object of a program which it transmits and has is in agreement, The control

approach of the information processor characterized by transmitting said program information to low-ranking electronic equipment, and having the process which carries out storage maintenance when it is judged that it is in agreement with this decision process.

[Claim 8] Said recognition process is the control approach of an information processor given in the 7th term of a claim characterized by recognizing further the version information of the program in the electronic equipment connected to low order.

[Claim 9] The 1st storage means which memorized the program which is the information processor which receives the control program sent from high order equipment, considers the program concerned as an expansion program and carries out executive operation, and performs basic actuation, The writing for storing said control program is possible. The 2nd storage means of a non-volatile, When the control program sent from said high order equipment is not able to be received normally The information processor characterized by having the control means which the program which made impossible the function in which the program stored in said 2nd storage means corresponds, and was normally stored in the 2nd storage means the 1st [said] storage means and before combines.

[Claim 10] Receive the control program sent from high order equipment, and it stores in the non-volatile storage means in which predetermined writing is possible by considering the program concerned as an expansion program. When the control program which is the control approach of the information processor which carries out executive operation, and is sent from said high order equipment is not able to be received normally The function in which the program stored in said non-volatile storage means corresponds is made into impossible. The control approach of the information processor characterized by controlling to process by the program normally stored in the predetermined storage means and said predetermined non-volatile storage means which has memorized the existing basic program before combining.

[Claim 11] It has by the program information possible [high order equipment and / phase direction] and sent from the equipment of said high order. A transmitting means to be the information processor which updates an own program and to transmit the description information on the control program which self owns to high order equipment according to the predetermined demand from said high order equipment, The information processor characterized by having a registration means to receive the information sent from said high order equipment, and to register receipt information as a control program according to the format of the received information concerned after transmitting with this transmitting means.

[Claim 12] Said registration means is an information processor given in the 11th term of a claim characterized by thawing and registering the information concerned, and writing in the non-volatile storage means in which predetermined writing is possible as it is if it is an incompressible format in being the information on the format that said received information was compressed.

[Claim 13] It has by the program information possible [high order equipment and / phase direction] and sent from the equipment of said high order. The transmitting process which is the control approach of the information processor which updates an own program, and transmits the description information on the control program which self owns to high order equipment according to the predetermined demand from said high order equipment, The control approach of the information processor characterized by having the registration process which receives the information sent from said high order equipment, and registers receipt information as a control program according to the format of the received information concerned after transmitting according to this transmitting process.

[Claim 14] Said registration process is the control approach of an information processor given in the 13th term of a claim characterized by thawing and registering the information concerned, and writing in the non-volatile storage means in which predetermined writing is possible as it is if it is an incompressible format in being the information on the format that said received information was compressed.

[Claim 15] It is the information processor which the electronic equipment connected to low order and the phase direction communication link are possible, and manages the program information in low-ranking electronic equipment. The 1st decision means which judges which control program should be updated among two or more control programs which the electronic equipment

connected to said low order owns, The 2nd decision means which judges whether the program which should be transmitted to low-ranking electronic equipment is transmitted in the 1st format, or it transmits in the 2nd format based on the decision result of this decision means, this -- the information processor characterized by having the control means which transmits said program in the format based on the decision result of the 2nd decision means, and gives a storage maintenance demand to low-ranking equipment.

[Claim 16] It is an information processor given in the 8th term of a claim characterized by judging any of said 1st and 2nd format said 1st and 2nd formats are equivalent to compressed format and an incompressible format, and it is made based on the capacity of the program information which should transmit said 2nd decision means and pressing time, transmission speed, and the defrosting rate in low order equipment.

[Claim 17] It is the control approach of an information processor of the electronic equipment connected to low order and the phase direction communication link being possible, and managing the program information in low-ranking electronic equipment. The 1st decision process which judges which control program should be updated among two or more control programs which the electronic equipment connected to said low order owns, The 2nd decision process which judges whether the program which should be transmitted to low-ranking electronic equipment is transmitted in the 1st format, or it transmits in the 2nd format based on the decision result of this decision process, this -- the control approach of the information processor characterized by having the control process which transmits said program in the format based on the decision result of the 2nd decision process, and gives a storage maintenance demand to low-ranking equipment.

[Claim 18] It is the control approach of an information processor given in the 17th term of a claim characterized by judging any of said 1st and 2nd format said 1st and 2nd formats are equivalent to compressed format and an incompressible format, and it is made based on the capacity of the program information which should transmit said 2nd decision process and pressing time, transmission speed, and the defrosting rate in low order equipment.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention uses an information processor and its control approach, and the program information supplied from high order equipment in detail as an improvement program in functional, or relates to the information processor which supplies the improvement program in functional to low-ranking equipment, and its control approach.

[0002]

[Description of the Prior Art] Conventionally, memory management control units, such as a computer, connect image formation equipment by the external device and communication media, and the control program which should be changed into the nonvolatile memory which image formation equipment has is transmitted.

[0003]

[Problem(s) to be Solved by the Invention] However, it sets to the systematized image formation equipment, and accidentally, the control program of other sequence equipments is transmitted, or an operator transmits the control program of the function which is not needed in image formation equipment, and there is a possibility of causing malfunction in the image formation equipment after a transfer.

[0004] Moreover, it may become the situation where cannot desire normal actuation any longer or it will not operate at all if it is the case where the program for carrying out improvement in functional is transmitted from the location especially left enough in distance and abnormalities arise in the transmission.

[0005] Furthermore, when transmitting the program of big size etc., it also becomes kept waiting for a long time until the equipment by the side of a sink can use the function of the program.

[0006]

[Means for Solving the Problem] This invention is made for the purpose of solving an above-mentioned technical problem, and tends to offer the information processor which makes it possible to raise the function as it is also by the program as which operating certainly was promised, and its control approach.

[0007] In order to solve this technical problem, the information processor of this invention is equipped with the configuration shown below. Namely, it has by the program information possible [high order equipment and / phase direction] and sent from the equipment of said high order. A transmitting means to be the information processor which updates an own program and to transmit an own model and the information about a function to high order equipment according to the predetermined demand from said high order equipment, When program information is received from said high order equipment after transmitting the model of said self, and the information about a function with this transmitting means, it has the storage maintenance means which carries out storage maintenance of the program information concerned.

[0008] Or a recognition means to be the information processor which the electronic equipment connected to low order and the phase direction communication link are possible, and manages the program information in low-ranking electronic equipment, and to recognize the model and function of electronic equipment which were connected to said low order, It has the recognition

result of this recognition means, a decision means to judge whether the object of a program which it transmits and has is in agreement, and the means that transmits said program information to low-ranking electronic equipment, and carries out storage maintenance when it is judged that it is in agreement with this decision means.

[0009] Moreover, other invention tends to offer the information processor which secures fundamental processing actuation, and its control approach, making impossible positively use of the program which became the radical of the trouble, even if any trouble occurs during a communication link.

[0010] In order to attain this technical problem, the information processor of this invention is equipped with the following configurations. Namely, the 1st storage means which memorized the program which is the information processor which receives the control program sent from high order equipment, considers the program concerned as an expansion program and carries out executive operation, and performs basic actuation, The writing for storing said control program is possible. The 2nd storage means of a non-volatile, When the control program sent from said high order equipment is normally unreceivable, the function in which the program stored in said 2nd storage means corresponds is made into impossible, and it has the control means which the program normally stored in the 2nd storage means the 1st [said] storage means and before combines.

[0011] Moreover, the further purpose of this invention tends to offer the information processor to which it closes shortening the time amount concerning updating of a program efficiently if, and its control approach. For this reason, it has the following configurations. It has by the program information which equipment and the phase direction communication link are as possible as a ** top, and is sent from the equipment of said high order. A transmitting means to be the information processor which updates an own program and to transmit the description information on the control program which self owns to high order equipment according to the predetermined demand from said high order equipment, After transmitting with this transmitting means, the information sent from said high order equipment is received, and it has a registration means to register receipt information as a control program, according to the format of the received information concerned.

[0012] Or it is the information processor which the electronic equipment connected to low order and the phase direction communication link are possible, and manages the program information in low-ranking electronic equipment. The 1st decision means which judges which control program should be updated among two or more control programs which the electronic equipment connected to said low order owns, The 2nd decision means which judges whether the program which should be transmitted to low-ranking electronic equipment is transmitted in the 1st format, or it transmits in the 2nd format based on the decision result of this decision means, this --- said program is transmitted in the format based on the decision result of the 2nd decision means, and it has the control means which gives a storage maintenance demand to low-ranking equipment.

[0013]

[Embodiment of the Invention] Hereafter, an example of the operation gestalt which starts this invention according to an accompanying drawing is explained to a detail.

[0014] <1st operation gestalt> drawing 1 is drawing showing the example of a configuration of the memory management control unit which is 1 operation gestalt in connection with this invention.

[0015] In drawing 1 , 100 is a control section to which the body of image formation equipment (it considered as the reproducing unit with the operation gestalt) and 300 perform the control unit of image formation equipment 100, and 400 performs motion control of image formation equipment 100, rewriting control of memory, and communications control with an external device. Moreover, 500 is a detecting element which detects the operating state of image formation equipment 100. Moreover, 900 is one of the external devices, and it is the host computer which takes out the memory rewriting instruction of image formation equipment 100 from the exterior, and 901 is a communication circuit which ties the host computer 900 with image formation equipment 100, and uses RS-232C here.

[0016] Drawing 2 is the block diagram showing the detail configuration of a control section 400 shown by drawing 1. In drawing 2, 401 is CPU which controls image formation equipment 100, and 402 memorizes the control program of image formation equipment 100, is rewritable nonvolatile memory electrically, and is a flash memory with this operation gestalt. 403 is RAM used as a field, working storage, etc. of storage of a I / O data, 404 is ROM which records the program which makes a self-judgment of a control program for a flash memory 402 to rewrite and the operating state of image formation equipment 100, and 410 is an I/O interface which performs the communication link with an external device 900. 408 and 409 are an address bus and a data bus.

[0017] Moreover, image formation equipment 100 shall have the rewriting mode when performing rewriting of the normal mode and a flash memory 402 which performs the usual copy actuation etc. In rewriting mode, other actuation shall not be received until rewriting is completed.

[0018] Thus, in the constituted image formation equipment 100, if it rewrites from a host computer 900, a mode shift instruction is transmitted and image formation equipment 100 receives through the I/O interface 410, a control section 400 will perform predetermined actuation based on the program which judges the operating state memorized by the flash memory 402, and will judge the operating state of image formation equipment 100. When it is judged as the condition that image formation equipment 100 is not rewritten by said decision result, a rewriting inhibiting signal is transmitted to a host computer 900.

[0019] Moreover, a rewritable signal is transmitted to a host computer 900 at the same time the condition is canceled, even if it rewrites in the above and is in the condition of prohibition.

[0020] Furthermore, it considers rewriting image formation equipment 100 from a remote place, before transmitting a rewritable signal to a host computer 900, a message shall be displayed on the display prepared in the control unit, and the function to receive directions of the authorization and disapproval of a user shall also be added.

[0021] Then, if it rewrites from a host computer and image formation equipment 100 transmits an enabling signal to the demand in the mode, image formation equipment 100 will transmit the function ID to express the compound function in the ID number showing an own model, and image formation equipment to a host computer 900 through a communication circuit 901.

Thereby, a host computer 900 judges whether the control program which it is going to transmit from now on agrees to the equipment of the destination by the model ID number which received, and if it has not agreed, it transmits the information on the purport which stops a transfer of a control program to image formation equipment 100. In the image formation equipment 100 side, the message which shows that it was not able to transmit to a control unit is displayed.

Moreover, if it has agreed, it will display on a control unit that the functional ID number which expresses a function below was checked, and it was not able to transmit if it did not agree. If it has agreed, an enabling signal will be transmitted to image formation equipment 100 through a communication circuit 901 at a control section 400 from a host computer 900, and the program of the flash memory rewriting actuation memorized by ROM404 by CPU401 will be performed.

When it is judged that it differs, a transfer of a control program is stopped, and it transmits that a control program cannot be transmitted to a control section 400, and displays on the control unit 300 of the body 100 of image formation equipment.

[0022] Drawing 3 is the sectional view showing the configuration of the body 100 of image formation equipment shown in drawing 1, is divided into the reader section 1 and the printer section 2 below, and explains a configuration and actuation.

[0023] In the reader section 1, one manuscript loaded on the manuscript feeding device 101 is conveyed at a time on the manuscript base glass side 102 one by one. If the predetermined location HE manuscript of the glass side (generally called platen glass) 102 is conveyed for a manuscript, lighting and the scanner unit 104 will move and the lamp 103 of the scanner section will irradiate a manuscript. Image formation of the reflected light of a manuscript is carried out to CCD109 through mirrors 105, 106, and 107 and a lens 108, and photo electric conversion is carried out here. The changed electrical signal is sent to the image-processing section 110 (it corresponds to the control section 400 of an operation gestalt).

[0024] In the image-processing section 110, the image processing set up by various control units

is performed. Moreover, it also has the function to have an image memory and to rotate the output direction of an image. Moreover, the function which changes the signal from the reader section 1 to the host computer 900 which is the printer section 2 or an external device, the signal from the reader section 1, or the signal from an external device 900 is chosen, and it also has the external change circuit which performs the work linked to the printer section 2. That is, if it sees from a host computer 900, the equipment in an operation gestalt will function also as an image scanner, and will function also as a printer.

[0025] The electrical signal connected to the printer section 2 in the external change circuit of the image-processing section 110 irradiates the photo conductor 202 changed into the lightwave signal modulated by the exposure control section 201. The latent image made by exposure light on the photo conductor 202 is developed by the development counter 203. The tip and timing of the above-mentioned development are combined, a transfer paper is conveyed from the transfer paper loading section 204 or 205, and the image by which development was carried out [above-mentioned] in the imprint section 206 is imprinted. After a transfer paper is fixed to the imprinted image in the fixing section 207, it is discharged by the equipment exterior from a delivery unit 208. The transfer paper outputted from the delivery unit 208 is passed to a sorter 220. When sorter ability is working, when [for which a sorter 220 is discharged in order by trays 2202-2208] the sort function is not working, it operates to the appearance fundamentally discharged by the top tray 2201 like.

[0026] Then, how to output the image read one by one to both sides of one sheet of output form is explained. Once, the conveyance sense of after conveyance and a form is reversed to a delivery unit 208, and the output form to which it was fixed in the fixing section 207 is conveyed in the transferred paper loading section 210 for re-feeding through the conveyance direction change member 209. Since paper will be fed from the transferred paper loading section 210 for re-feeding about a transfer paper although a manuscript image is read like the above-mentioned process if the following manuscript is prepared, the manuscript image of two sheets can be outputted to the front face of the same output paper, and a rear face after all.

[0027] Drawing 4 is the block diagram of a control unit 300. In drawing 4, 301 is a display and displays operating state and a message. Moreover, it is a touch panel transparent in the front face of a display 301, and works as a selection key by touching a front face. 302 is a ten key and is a key which inputs the number of copies etc. 303 is a start key and actuation is started from pressing this key.

[0028] Next, actuation is explained using the flow chart of drawing 5.

[0029] In the case of an external device and this operation gestalt, this program expresses the operating state of a host computer 900.

[0030] First, the acknowledge signal of a situation of operation is required of image formation equipment 100 from a host computer 900 (step S501). If it can shift to the condition in rewriting mode and image formation equipment 100 will judge at this time, that condition will be displayed on a control unit 300. The information on the purport which image formation equipment 100 rewrote and shifted to the mode is transmitted to a host computer 900. A host computer 900 receives this, requires the model ID number of image formation equipment 100 (step S502), and receives Model ID. A host computer 900 judges whether the model of this model ID number (information on the purport which is a copying machine with an operation gestalt), and control program which should be transmitted has agreed (step S503). If it has not agreed, a control program transfer disapproval signal (step S512) and disapproval level (what shows whether it became impossible in which phase to transmit) are transmitted to image formation equipment 100 through a communication circuit 901 (step S513). If image formation equipment 100 receives this information, a message to that effect will be displayed on a control unit 300. Moreover, a host computer transmits a rewriting mode terminate signal (step S515), and tells image formation equipment 100 about termination in rewriting mode.

[0031] On the other hand, when it is judged at step S503 that it agreed, the functional ID number of image formation equipment 100 is required (step S505). In the case of the image formation equipment 100 of an operation gestalt, ID information on a purport that it functions as an image scanner and a printer will be sent out.

[0032] A host computer 900 receives this, and when having not agreed, it processes steps S512-S514 shown previously. Moreover, when it agrees, the version of the control program which current and image formation equipment 100 are using is required (step S508). If new in whether it is the same as the control program version which the transmitted version transmits after this, since it is not necessary to transmit, steps S512-S514 are processed.

[0033] Moreover, when it is judged that a version is old, a transfer of a control program is performed (step S511). After a transfer of a control program finishes, a rewriting mode terminate signal is transmitted to image formation equipment 100 (step S515), and it displays that rewriting was completed on the control unit 300 of image formation equipment 100, and changes into the normal mode.

[0034] Next, the actuation in the body 100 of image formation equipment in an operation gestalt is explained. In addition, the program for performing this actuation is stored in ROM404.

[0035] The body 100 of image formation equipment is always waiting for the directions from a host computer 900. Here, if rewriting mode directions information is received (step S601), processing will progress to step S602 and operating state will be checked by the operating state detecting element 900 within the body 100 of image formation equipment (step S602).

[0036] If it is judged that it may rewrite from the operating state detecting element 500, and you may shift to the mode, it will indicate that it rewrites to a control unit 300 and shifts to the mode (step S603), and many functions of image formation equipment 100 will be suspended (step S604).

[0037] In addition, when the shift to rewriting mode cannot be performed, for example, or it is under printing from the case where it is [present copy] under processing, and another host computer, it is a case working as image scanner equipment etc.

[0038] Now, it transmits having shifted to rewriting mode to a host computer 900 through the above actuation (step S605). With, in order to perform trailer substitute actuation, the rewriting program separately memorized by ROM404 is started (step S606).

[0039] After this, it will operate in order to perform communication with the host computer 900 explained by drawing 5 explained previously.

[0040] As explained above, according to this operation gestalt, by judging the model of equipment of the destination, a function, and a version by the ID number, it can mistake and a control program can be transmitted now that there is nothing.

[0041] Moreover, since checking a model and a function in a high order equipment side will be performed without image formation equipment transmitting Model ID when a control program is received, the control program received in that case is not rewritten.

[0042] With the <operation gestalt of ** 2nd> above-mentioned implementation gestalt (1st operation gestalt), although it judged whether it was the object which can transmit image formation equipment 100 by the host computer 900 side, the example which gives this judgment to the image formation equipment 100 side is explained as 2nd operation gestalt. However, an equipment configuration is made into the same thing as the 1st operation gestalt, and the explanation is omitted.

[0043] It is same to start the rewriting program finally stored in ROM404 also with the 2nd operation gestalt from the host computer 900 according to the procedure shown in drawing 6 when the rewriting mode signal was received. Therefore, below, the contents of processing of this rewriting program are explained.

[0044] Drawing 7 is a flow chart which shows the procedure of the rewriting program in the 2nd operation gestalt.

[0045] First, in order to judge what kind of things the model ID number of the control program which the host computer 900 is going to transmit after this when the program of the rewriting program in ROM404 starts, a functional ID number, and a version ID number are, the transfer request is transmitted to a host computer 900 (steps S701, S704, and S707). consequently, the seed information (model ID) and functional information (function ID) that the program which it is going to transmit from a host computer 900 can be adapted -- version information is sent further. And it judges whether the model ID of such information and self and Function ID which have been sent, and the program which is going to investigate in order of a version further, and

is going to go, and a host computer 900 tends to transmit can suit self, and it should update further. In discernment of a version, it differs from the 1st operation gestalt explained previously. namely, the same ** as the control program version in which the control program which it is going to transmit is carrying out current use — when old, a transfer disapproval signal (step S710) and disapproval level (step S712) are transmitted to a host computer 900. Also in the body 100 of image formation equipment, it combines that a transfer is impossible with a control unit 300 with disapproval level, and displays (step S712).

[0046] When all the above decision is cleared, a control program transfer is required of a host computer (step S713). And a flash memory is rewritten as it is also with the sent control program (step S714). It rewrites at the end, a mode terminate signal is transmitted to a host (step S715), and it rewrites to a control unit 300, and mode termination is displayed (step S716) and it ends (step S710).

[0047] A control program is transmitted with the above actuation. Although adjustment of the control program which should be transmitted from the position of a host computer 900, and the body 100 of image formation equipment was performed with the 1st operation gestalt, it is the description with the operation gestalt 2 to process in the position of the body 100 of image formation equipment.

[0048] In addition, with the above-mentioned operation gestalt, although target equipment considers as a copying machine, the invention in this application may not be limited by this, and an image scanner, a printer, facsimile apparatus, etc. may be what kind of things. Moreover, with an operation gestalt, although the host computer was made into the example as an external device, the invention in this application is not limited by this, either. Furthermore, although the operation gestalt explained the example which connects two equipments with serial interface (RS-232C) again, of course, it is good also as communication between two equipments under the environment where connect the communication configuration not only through this but through the network, and the equipment of three or more equipments was connected.

[0049] <Operation gestalt of ** 3rd> drawing 8 is the block diagram showing the configuration of the image formation equipment of the 3rd operation gestalt of this invention. The reader section 1 reads the image of a manuscript and outputs the image data according to a manuscript image to the printer section 2 and image I/O control unit 3. The printer section 2 records the image according to the image data from the reader section 1 and image I/O control unit 3 in the record paper. It connects with the reader section 1 and image I/O control unit 3 consists of the facsimile section 4, the file section 5, the computer interface section 7, the formatter section 8, the image memory section 9, the core section 10, etc.

[0050] Moreover, an external device (for example, host computer) 13 is a thing for upgrading the program of image formation equipment, and is connected with the core section 10 through the telephone line.

[0051] The facsimile section 4 compresses the image data which elongated ***** which received through the telephone line, and transmitted the elongated image data to the core section 10, and was transmitted from the core section 10, and transmits the compressed compression image data through the telephone line. The hard disk 12 is connected to the facsimile section 4, and the image data and the compression image data which received which should transmit can be saved temporarily. The Magnetic—Optical disk drive unit 6 is connected to the file section 5, and the file section 5 compresses the image data transmitted from the core section 10, and is stored in the magneto-optic disk set to the Magnetic—Optical disk drive unit 6 with the keyword for searching the image data. Moreover, the file section 5 searches the compression image data memorized by the magneto-optic disk based on the keyword transmitted through the core 10, reads the searched compression image data, develops, and transmits the elongated image data to the core section 10.

[0052] The computer interface section 7 is an interface between a personal computer or a workstation (PC/WS) 11, and the core section 10. Developing the formatter section 8 to the image data which can record the code data showing the image transmitted from PC/WS11 in the printer section 2, the image memory section 9 memorizes temporarily the data transmitted from PC/WS11. Although later mentioned about the core section 10, the core section 10 controls the

data flow between each of the reader section 1, the facsimile section 4, the file section 5, the computer interface section 7, the formatter section 8, and the image memory section 9.

[0053] In addition, the cross-section configuration of the image formation equipment in the 3rd operation gestalt and its activity consider as the same thing as drawing 3, and the explanation is omitted.

[0054] Drawing 9 is the block diagram of the reader section 1. As for the image data outputted from CCD109, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 110. The image data processed by the A/D-SH section 110 is transmitted to the core section 10 of image I/O control unit 3 through the interface section 113 while it is transmitted to the printer section 2 through the image-processing section 111. CPU114 controls the image-processing section 111 and an interface 113 according to the contents of a setting set up by the control unit 126 in the core section 10 mentioned later. For example, when the copy mode which copies by performing trimming processing by the control unit 126 is set up, the information is passed to CPU114 through an interface 113 from the core section 10. And trimming processing is made to perform in the image-processing section 111, and it is made to transmit to the printer section 2. Moreover, when the facsimile transmitting mode is set up by the control unit 126, image data and the control command according to the set-up mode are made to transmit to the core section 10 from an interface 113. The control program of such CPU114 is memorized by memory 116, and CPU114 controls, referring to memory 116. Moreover, memory 116 is used also as a working area of CPU114.

[0055] Drawing 10 is the block diagram of the core section 10. While the image data from the reader section 1 is transmitted to the data-processing section 121, the control command from the reader section 1 is transmitted to CPU123. The data-processing section 121 performs image processings, such as rotation processing of an image and variable power processing, and the image data transmitted to the processing section 121 from the reader section 1 is transmitted to the facsimile section 4, the file section 5, and the computer interface section 7 through an interface 120 according to the control command transmitted from the reader section 1. Moreover, the code data showing the image inputted through the computer interface 7 are transmitted to the back formatter section 8 transmitted to the data-processing section 121, it is developed by image data, and after this image data is transmitted to the data-processing section 121, it is transmitted to the printer section 2 through the facsimile section 4 or the reader section 1. After the image data from the facsimile section 4 is transmitted to the data-processing section 121, it is transmitted to the printer section 2, the file section 5, and the computer interface section 7. Moreover, after the image data from the file section 5 is transmitted to the data-processing section 121, it is transmitted to the printer section 2, the facsimile section 4, and the computer interface section 7. CPU123 performs such control according to the control program memorized by memory 124 and the control command transmitted from the reader section 1. Moreover, memory 124 is used also as a working area of CPU123. Thus, it is possible to perform processing which compounded functions, such as reading of a manuscript image, a print of an image, transmission and reception of an image, preservation of an image, and I/O of the data from a computer, focusing on the core section 10. Interfaces 125 are interfaces for external device connection, such as RS232C used for version up, and are connected with an external device through the telephone line by drawing 8.

[0056] Drawing 11 shows the detail of the memory section 124 in the core section 10. The program for CPU123 to carry out various processing actuation of the flash ROM 503 is stored. RAM501 is used as the backup data storage of the core section 10, and a working-level month RAM of CPU124. Another program for EPROM502 to realize the minimum function of a control unit and copy actuation among the functions as the core section is stored. With this operation gestalt, in copy actuation, it considers only as an one side copy and the control unit is also supporting only the function.

[0057] Drawing 12 shows the configuration of the program in a flash ROM 503. The flash ROM 503 is divided into the block of 16 by all that are shown by 0-15, and can perform rewriting per block. The down program used in case a flash ROM 503 is rewritten for block 0 is stored. In addition, the block 0 has composition whose rewriting is impossible in hard. The flash ROM

currently used with this operation gestalt has two, the normal mode and a write mode, and is the thing of a configuration of that data cannot be read from a flash ROM in a write mode. flash ROM rewriting [in / the sake / this operation gestalt] — if working, the download program of block 0 is transmitted to RAM501, and the flash ROM is rewritten.

[0058] Block 1 is a module which performs I/F control of the reader section, and block 2 is a module which controls the data-processing section. Block 3 is a module which controls the printer section, and block 4 is a module which controls I/F of FAX. Moreover, the module with which block 5 performs I/F control of FILE, the module with which block 6 controls I/F of a computer, and block 7 are modules which control other I/F.

[0059] Block 8 is a module which controls the common setting item of a control unit, and this block is the software relevant to all actuation. Block 9 is a module which controls a copy control unit. Block 10 is a module which controls the control unit of facsimile. Block 11 is a module which controls the control unit of a file. Block 12 is a module which controls the control unit of a printer. Moreover, for the moment, blocks 13–15 are secured to reserves.

[0060] Since it directs which part (program module) the external communication equipment 13 upgrades by the communication link between an external instrument 13 and a core 10, a core 10 can know which block is upgraded. Here, the procedure in the case of rewriting the program of the block 11 (file manipulation program module) in drawing 12 is explained according to the flow chart of drawing 13.

[0061] in addition, the program based on the flow chart of this drawing — the connection request from an external device 13 — it is — in addition — and it is started when the directive command of a purport which rewrites is received.

[0062] First, it waits until image formation equipment confirms whether to be in the rewritable conditions under copy, before a wait rise, etc. and becomes possible at step S1. Moreover, when it is judged that it is in a rewritable condition, it progresses to step S2, a flash ROM is set as rewriting mode, and the program of block 0 is transmitted to RAM501.

[0063] Subsequently, the rewriting program on RAM501 is performed in step S3. In step S4, it is confirmed whether rewriting of a program was successful for every constant-rate unit of a certain. With this operation gestalt, the comparison with the data received the checksum sent from an external device 13 using a checksum and now is performed. when a checksum is in agreement, it confirms whether to be rewriting termination at step S5 (for example, a ***** [having received the command of the purport which transmission of rewriting data ended] — or the command which shows the amount of data which should be transmitted first is received, and it judges by whether the reception was completed). When having not ended yet, sequential execution of the return rewriting is carried out to step S3. In this way, if rewriting is completed, it progresses to step S6, and from rewriting mode, a flash ROM will be made to shift to the normal mode, and it will end.

[0064] On the other hand, when rewriting fails in step S4, it progresses to step S7 and detects of which block rewriting went wrong. With this operation gestalt, since it is failure of block 11, what the block 11 (file manipulation section) went wrong is detected. Next, it progresses to step S8, file-related software activation is stopped, and it returns to step S6.

[0065] The control unit display by the normal mode is shown in drawing 14, and the actuation is explained below. The display shown in drawing 14 is a key currently displayed in software on the liquid crystal display screen of the control unit prepared in this equipment. 801 is an extended key, and if this key is pressed, it will change to the display for performing a double-sided copy key etc. 802 is an image mode key, and when performing image processings, such as reversal and italic, it is used. 803 is the user mode key which a user can define. 804 is a key used when setting up in-every-direction independent variable power etc. 805–807 are mode memory keys, and an operator makes the mode frequently used to these keys register, and it makes it possible to exclude two or more setup as at least one key stroke is.

[0066] 808 is a call key, and when calling back the mode in front of actuation, it is used. 809 is an option key and is a key used when the option is set up. 810 is a key used when using a sorter. 811 is a key used when specifying manuscript mixed-loading mode. 812 is a key which sets up a scale factor to 100%. 813,814,815 is a key used at the time of the variable power of fixed form

expansion, fixed form contraction, and 1% unit, respectively. 816 is a form selection key. 817 is a display which shows concentration and displays the degree of the concentration as level by actuation of the key used for modification of the concentration of 818,819. 820 is a key which sets up automatic exposure. 821 is a key used when reproducing a photograph manuscript finely. 822 is a key used when reproducing the alphabetic character of an alphabetic character manuscript to Sharp more.

[0067] Moreover, 823 is a Help key for giving various explanation etc. 824 is a key pressed when using it as copy mode. That is, drawing 14 is a screen which displays that it is pushed by the key 824. 825 is a key pressed when using it as facsimile mode. 826 is a key pressed when using it as a file mode. 827 is a key pressed when using it as printer mode (that is, this equipment functions also as a usual printer in response to the print data from a host computer).

[0068] Now, when rewriting of a program is successful, the control unit of image formation equipment becomes like drawing 14. On the other hand, when rewriting (download) of the control unit program of a file goes wrong as explained previously for example, it becomes the display shown in drawing 15. That is, the key 826 which sets up a file mode will be lost. File-related actuation will be forbidden by these 826 keys being lost. Furthermore, a message called version up failure of the file section is outputted. Although illustration is not carried out, since version up failure is indicated also like the external device 13, although it is natural also to a serviceman, you are told about.

[0069] The detailed block diagram of steps S7 and S8 shown in drawing 16 by drawing 13 is shown.

[0070] First, the key which judges the block which went wrong at step S11, chooses the function corresponding to step S12-15, and can choose the function at step S16 is deleted from a control unit. Usually, the software of a screen is contained [control unit / of block 8].

[0071] Next, explanation when rewriting goes wrong in the control unit common software of block 8 among the blocks shown in drawing 12 is given. Since fundamental actuation is the same as the above, explanation is omitted.

[0072] now, the step [in / in the processing in this case / drawing 13] S -- seven differ from eight. Then, this part is explained according to the flow chart of drawing 17.

[0073] Since rewriting of control unit common software went wrong, the contents of the block which it progressed to step S11 and went wrong are checked in the block relevant to all actuation. If not in agreement, it progresses to step S11 of drawing 16, and a correspondence key is deleted and it progresses to step S6. On the other hand, when in agreement, it sets up and returns to step S6 so that it may progress to 22 and software may be performed by RAM502.

[0074] The flow chart of processing of the whole equipment of operation is shown in drawing 18, and it explains below.

[0075] At step S31, it judges whether it is ROM actuation. When ROM actuation is not specified (i.e., when performing normal operation), it progresses to step S32 and the program on 503 flash ROMs is performed. At step S33, it is confirmed whether the mode was set up by the control unit and the operational request occurred. When an operational request does not occur, it will wait at step S33.

[0076] For example, suppose that a setup called five copies of variable power was performed 70%, and the copy operational request occurred. In this case, copy actuation is performed on the conditions set up at step S34, and it returns to step S31.

[0077] On the other hand, as drawing 12 explained at step S31, when ROM actuation is set up, it branches to step S35, and the program on EPROM502 is performed. As mentioned above, with this operation gestalt, it considers only as the one side copy in copy actuation, and the program to which a control unit also supports only the function is carried in EPROM502. Subsequently, it waits for a copy operational request to occur at step S36. If it generates, it will progress to step S37, copy actuation will be performed, and it will return to step S31. The display screen of the control unit at that time is shown in drawing 19. It turns out that only a copy actual size one side copy is made. Furthermore, since download went wrong, the message of operating by the minimum function is outputted. What download went wrong is told although it is natural also to a

serviceman, since it is displayed also like the external device (not shown).

[0078] With an operation gestalt, although the copy actuation minimum function is carried on 502EPROM, this may be facsimile, a printer, and the minimum function of a file.

[0079] <the 4th operation gestalt> -- the 4th operation gestalt is explained. Drawing 20 is the block diagram showing the configuration of the 4th operation gestalt.

[0080] In illustration, the same sign was attached about the same configuration as drawing 1 explained previously. However, the control section 400 in the operation gestalt of *** 4 carries out motion control based on the program which thaws the motion control of image formation equipment 100, rewriting control of memory, the communications control that communicates with a data control communication device, and the compressed data. Moreover, 901 is a communication circuit which connects image formation equipment 100 to a host computer 900, and RS-232C is used for it here.

[0081] Drawing 21 is the block diagram showing the detail configuration of the above-mentioned control section 400. The illustration smell also gave the same sign to the same configuration as drawing 2. Therefore, 401 is CPU which controls image formation equipment 100, and 402 is a flash memory here in nonvolatile memory rewritable on the electric target which memorizes a control program and the information on data rewritten. 403 is RAM used as the field and working storage of input data. A program for 404 to rewrite a flash memory 402 (program corresponding to each flow chart mentioned later), It is ROM which memorizes the program which thaws the compressed data program, 410 is an I/O interface which communicates with the data control communication device 9, and 408 and 409 are the address buses and data buses of CPU401.

[0082] Thus, the data program which rewrites a host computer 900 with the operation gestalt of *** 4 makes compress, it transmits in the image-formation equipment 100 and the host computer 900 which were constituted, and image-formation equipment 100 rewrites the data which received this through the I/O interface 401, thawed the program based on the program which thaws the data program into which ROM404 of a control section 400 was compressed, and were thawed by the flash memory 402 of a control section 400.

[0083] Furthermore, it judges whether the time amount of rewriting is early, and the way which compressed and performed the data transfer from this defrosting time amount etc. in the number of data of the data which rewrite a host computer 900, and image formation equipment 100 adds also performing actuation based on the decision. The time amount of rewriting here is time amount including a data transfer, compression, defrosting, etc.

[0084] In addition, structure of image formation equipment 100 is made into the same thing as drawing 3 shown with the 1st previous operation gestalt, and explanation here is omitted.

[0085] Now, the data which a host computer 900 has and to rewrite, and the data which are memorized by the flash memory 402 of image formation equipment 100 and which are rewritten consist of 16 blocks also in the operation gestalt of *** 4. Since said flash memory 402 is rewritable per block, the data by the side of a body are compared with the data by the side of a host, and only a conflicting block can rewrite. If there is little block count to rewrite when rewriting under such a premise, the effectiveness of the time amount which requires the way which did not compress the data to rewrite but was transmitted to image formation equipment 100 as it was for rewriting is sometimes good. Therefore, the block count to rewrite, the communication link time amount of data, and the defrosting time amount of the data by the side of image formation equipment can be judged with image formation equipment 100 and a host computer 900, and more effective data can be rewritten by adding decision whether data are compressed and transmitted to a host computer.

[0086] Next, actuation is explained using the flow chart of drawing 22. The flow chart of the program by the side of the host computer 900 at the time of judging whether drawing 22 compresses and transmits a program is shown.

[0087] First, to image formation equipment 100, the SEND statement of the checksum for every whole block of the flash ROM in image formation equipment is transmitted (S401), and it waits for reception of the checksum from image formation equipment 100 (S402). It detects which block should change from the received checksum after receiving this notice, and the block count to rewrite and the amount of data of a program are computed. The time amount which transmits

the time amount and program data which are applied to compression and defrosting from the computed program amount of data is computed (S403).

[0088] In the host computer's 900 having data of / (program amount of data) here beforehand (time amount which it takes when program data are transmitted as it was), comparing the data with said computed data of time amount, and rewriting program data, it judges that it is [rewriting] quicker whether to compress and transmit program data (S404). And if judged as no by this decision, a rewriting instruction will be transmitted to image formation equipment 100 (S405), and it will transmit to image formation equipment in a form as it is, without compressing into program data (S406).

[0089] When it is judged that it is earlier to transmit compressed data on the other hand, a compression move instruction is transmitted to image formation equipment 100 (S407), the program data to rewrite are compressed (S408), a rewriting instruction is transmitted to image formation equipment (S409), and the compressed program data is transmitted to image formation equipment (S410).

[0090] Next, the actuation by the side of image formation equipment is explained using the flow chart of drawing 5.

[0091] First, it has a checksum SEND statement from a host computer 900 (S510), and the checksum of each block of the program data memorized in it by the flash memory 402 after reception is transmitted to a host computer 900 (S502).

[0092] Subsequently, it waits to receive a compression move instruction or a rewriting instruction at steps S503 and S508.

[0093] Here, when a compression move instruction is received, it waits to receive a rewriting instruction (for the information which shows the rewriting instruction to which block (plurality is good) it is to also be included) next for reception of actual data at waiting (step S504) and step S505. If data are received, defrosting processing is performed at step S506, and the program code of the directed block will be generated and will be rewritten to a corresponding block (step S507).

[0094] On the other hand, when a mere rewriting instruction is received without receiving a compression move instruction, processing progresses to step S509 from step S508, and processing which writes in the data received in the block location included in the instruction as it is performed (step S510).

[0095] Although it judged whether it would be made to compress by the host computer side with the operation gestalt of the <operation gestalt of ** 5th> above 4th, the operation gestalt of **** 5 explains the case where two or more image formation equipments of each other are connected. That is, it is the example which makes the program to which it was upgraded in one image formation equipment reflect in other image formation equipments.

[0096] In this case, a system configuration is as being shown in drawing 24. That is, image formation equipment 500 is equivalent to the host computer of the operation gestalt of the above 4th, and image formation equipment 100 updates the flash ROM of the self which received the program.

[0097] It seems that the processing by the side of the image formation equipment 500 which is an informer is received according to the flow chart of drawing 25, it comes out, and the processing by the side of a certain image formation equipment 100 is shown in the flow chart of drawing 26 although it is a communication procedure. like illustration -- an informer -- and by winning popularity, since the near contents of processing are substantially [as the operation gestalt of the above 4th] the same, the explanation is omitted.

[0098] When suited under the environment where two or more image formation equipments were connected according to the operation gestalt of **** 5, it becomes possible for other image formation equipments to make an own program update automatically one after another only by rewriting an internal processing program as the processing explained with the 4th operation gestalt to one image formation equipment is also.

[0099] In addition, even if it applies this invention to the system which consists of two or more devices (for example, a host computer, an interface device, a reader, a printer, etc.), it may be applied to the equipments (for example, a copying machine, facsimile, etc.) which consist of one

device.

[0100] Moreover, being attained does not have that until it says by the purpose of this invention supplying the storage which memorized the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and reading and performing the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage, either.

[0101] In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.

[0102] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, etc. can be used, for example.

[0103] Moreover, it cannot be overemphasized by performing the program code which the computer read that it is contained also when the function of the operation gestalt mentioned above is not only realized, but it performs a part or all of processing that OS which is working on a computer is actual, based on directions of the program code and the function of an operation gestalt is realized by the processing.

[0104] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the extension board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[0105]

[Effect of the Invention] As explained above, according to this invention, it becomes possible to raise the function as it is also by the program as which operating certainly was promised.

[0106] Moreover, it becomes possible to secure fundamental processing actuation, making into impossible positively use of the program which became the radical of the trouble according to other invention, even if any trouble occurs during a communication link.

[0107] Moreover, according to the further invention, it is going to offer the information processor to which it closes shortening the time amount concerning updating of a program efficiently if .

For this reason, it has the following configurations.

[0108]

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention uses an information processor and its control approach, and the program information supplied from high order equipment in detail as an improvement program in functional, or relates to the information processor which supplies the improvement program in functional to low-ranking equipment, and its control approach.

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PRIOR ART

[Description of the Prior Art] Conventionally, memory management control units, such as a computer, connect image formation equipment by the external device and communication media, and the control program which should be changed into the nonvolatile memory which image formation equipment has is transmitted.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, it sets to the systematized image formation equipment, and accidentally, the control program of other sequence equipments is transmitted, or an operator transmits the control program of the function which is not needed in image formation equipment, and there is a possibility of causing malfunction in the image formation equipment after a transfer.

[0004] Moreover, it may become the situation where cannot desire normal actuation any longer or it will not operate at all if it is the case where the program for carrying out improvement in functional is transmitted from the location especially left enough in distance and abnormalities arise in the transmission.

[0005] Furthermore, when transmitting the program of big size etc., it also becomes kept waiting for a long time until the equipment by the side of a sink can use the function of the program.

[Translation done.]

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MEANS

[Means for Solving the Problem] This invention is made for the purpose of solving an above-mentioned technical problem, and tends to offer the information processor which makes it possible to raise the function as it is also by the program as which operating certainly was promised, and its control approach.

[0007] In order to solve this technical problem, the information processor of this invention is equipped with the configuration shown below. Namely, it has by the program information possible [high order equipment and / phase direction] and sent from the equipment of said high order. A transmitting means to be the information processor which updates an own program and to transmit an own model and the information about a function to high order equipment according to the predetermined demand from said high order equipment. When program information is received from said high order equipment after transmitting the model of said self, and the information about a function with this transmitting means, it has the storage maintenance means which carries out storage maintenance of the program information concerned.

[0008] Or a recognition means to be the information processor which the electronic equipment connected to low order and the phase direction communication link are possible, and manages the program information in low-ranking electronic equipment, and to recognize the model and function of electronic equipment which were connected to said low order. It has the recognition result of this recognition means, a decision means to judge whether the object of a program which it transmits and has is in agreement, and the means that transmits said program information to low-ranking electronic equipment, and carries out storage maintenance when it is judged that it is in agreement with this decision means.

[0009] Moreover, other invention tends to offer the information processor which secures fundamental processing actuation, and its control approach, making impossible positively use of the program which became the radical of the trouble, even if any trouble occurs during a communication link.

[0010] In order to attain this technical problem, the information processor of this invention is equipped with the following configurations. Namely, the 1st storage means which memorized the program which is the information processor which receives the control program sent from high order equipment, considers the program concerned as an expansion program and carries out executive operation, and performs basic actuation. The writing for storing said control program is possible. The 2nd storage means of a non-volatile, When the control program sent from said high order equipment is normally unreceivable, the function in which the program stored in said 2nd storage means corresponds is made into impossible, and it has the control means which the program normally stored in the 2nd storage means the 1st [said] storage means and before combines.

[0011] Moreover, the further purpose of this invention tends to offer the information processor to which it closes shortening the time amount concerning updating of a program efficiently if, and its control approach. For this reason, it has the following configurations. It has by the program information which equipment and the phase direction communication link are as possible as a ** top, and is sent from the equipment of said high order. A transmitting means to be the information processor which updates an own program and to transmit the description information

on the control program which self owns to high order equipment according to the predetermined demand from said high order equipment. After transmitting with this transmitting means, the information sent from said high order equipment is received, and it has a registration means to register receipt information as a control program, according to the format of the received information concerned.

[0012] Or it is the information processor which the electronic equipment connected to low order and the phase direction communication link are possible, and manages the program information in low-ranking electronic equipment. The 1st decision means which judges which control program should be updated among two or more control programs which the electronic equipment connected to said low order owns, The 2nd decision means which judges whether the program which should be transmitted to low-ranking electronic equipment is transmitted in the 1st format, or it transmits in the 2nd format based on the decision result of this decision means, this — said program is transmitted in the format based on the decision result of the 2nd decision means, and it has the control means which gives a storage maintenance demand to low-ranking equipment.

[0013]

[Embodiment of the Invention] Hereafter, an example of the operation gestalt which starts this invention according to an accompanying drawing is explained to a detail.

[0014] <1st operation gestalt> drawing 1 is drawing showing the example of a configuration of the memory management control unit which is 1 operation gestalt in connection with this invention.

[0015] In drawing 1, 100 is a control section to which the body of image formation equipment (it considered as the reproducing unit with the operation gestalt) and 300 perform the control unit of image formation equipment 100, and 400 performs motion control of image formation equipment 100, rewriting control of memory, and communications control with an external device. Moreover, 500 is a detecting element which detects the operating state of image formation equipment 100. Moreover, 900 is one of the external devices, and it is the host computer which takes out the memory rewriting instruction of image formation equipment 100 from the exterior, and 901 is a communication circuit which ties the host computer 900 with image formation equipment 100, and uses RS-232C here.

[0016] Drawing 2 is the block diagram showing the detail configuration of a control section 400 shown by drawing 1. In drawing 2, 401 is CPU which controls image formation equipment 100, and 402 memorizes the control program of image formation equipment 100, is rewritable nonvolatile memory electrically, and is a flash memory with this operation gestalt. 403 is RAM used as a field, working storage, etc. of storage of a I / O data, 404 is ROM which records the program which makes a self-judgment of a control program for a flash memory 402 to rewrite and the operating state of image formation equipment 100, and 410 is an I/O interface which performs the communication link with an external device 900. 408 and 409 are an address bus and a data bus.

[0017] Moreover, image formation equipment 100 shall have the rewriting mode when performing rewriting of the normal mode and a flash memory 402 which performs the usual copy actuation etc. In rewriting mode, other actuation shall not be received until rewriting is completed.

[0018] Thus, in the constituted image formation equipment 100, if it rewrites from a host computer 900, a mode shift instruction is transmitted and image formation equipment 100 receives through the I/O interface 410, a control section 400 will perform predetermined actuation based on the program which judges the operating state memorized by the flash memory 402, and will judge the operating state of image formation equipment 100. When it is judged as the condition that image formation equipment 100 is not rewritten by said decision result, a rewriting inhibiting signal is transmitted to a host computer 900.

[0019] Moreover, a rewritable signal is transmitted to a host computer 900 at the same time the condition is canceled, even if it rewrites in the above and is in the condition of prohibition.

[0020] Furthermore, it considers rewriting image formation equipment 100 from a remote place, before transmitting a rewritable signal to a host computer 900, a message shall be displayed on the display prepared in the control unit, and the function to receive directions of the

authorization and disapproval of a user shall also be added.

[0021] Then, if it rewrites from a host computer and image formation equipment 100 transmits an enabling signal to the demand in the mode, image formation equipment 100 will transmit the function ID to express the compound function in the ID number showing an own model, and image formation equipment to a host computer 900 through a communication circuit 901.

Thereby, a host computer 900 judges whether the control program which it is going to transmit from now on agrees to the equipment of the destination by the model ID number which received, and if it has not agreed, it transmits the information on the purport which stops a transfer of a control program to image formation equipment 100. In the image formation equipment 100 side, the message which shows that it was not able to transmit to a control unit is displayed.

Moreover, if it has agreed, it will display on a control unit that the functional ID number which expresses a function below was checked, and it was not able to transmit if it did not agree. If it has agreed, an enabling signal will be transmitted to image formation equipment 100 through a communication circuit 901 at a control section 400 from a host computer 900, and the program of the flash memory rewriting actuation memorized by ROM404 by CPU401 will be performed. When it is judged that it differs, a transfer of a control program is stopped, and it transmits that a control program cannot be transmitted to a control section 400, and displays on the control unit 300 of the body 100 of image formation equipment.

[0022] Drawing 3 is the sectional view showing the configuration of the body 100 of image formation equipment shown in drawing 1, is divided into the reader section 1 and the printer section 2 below, and explains a configuration and actuation.

[0023] In the reader section 1, one manuscript loaded on the manuscript feeding device 101 is conveyed at a time on the manuscript base glass side 102 one by one. If the predetermined location HE manuscript of the glass side (generally called platen glass) 102 is conveyed for a manuscript, lighting and the scanner unit 104 will move and the lamp 103 of the scanner section will irradiate a manuscript. Image formation of the reflected light of a manuscript is carried out to CCD109 through mirrors 105, 106, and 107 and a lens 108, and photo electric conversion is carried out here. The changed electrical signal is sent to the image-processing section 110 (it corresponds to the control section 400 of an operation gestalt).

[0024] In the image-processing section 110, the image processing set up by various control units is performed. Moreover, it also has the function to have an image memory and to rotate the output direction of an image. Moreover, the function which changes the signal from the reader section 1 to the host computer 900 which is the printer section 2 or an external device, the signal from the reader section 1, or the signal from an external device 900 is chosen, and it also has the external change circuit which performs the work linked to the printer section 2. That is, if it sees from a host computer 900, the equipment in an operation gestalt will function also as an image scanner, and will function also as a printer.

[0025] The electrical signal connected to the printer section 2 in the external change circuit of the image-processing section 110 irradiates the photo conductor 202 changed into the lightwave signal modulated by the exposure control section 201. The latent image made by exposure light on the photo conductor 202 is developed by the development counter 203. The tip and timing of the above-mentioned development are combined, a transfer paper is conveyed from the transfer paper loading section 204 or 205, and the image by which development was carried out [above-mentioned] in the imprint section 206 is imprinted. After a transfer paper is fixed to the imprinted image in the fixing section 207, it is discharged by the equipment exterior from a delivery unit 208. The transfer paper outputted from the delivery unit 208 is passed to a sorter 220. When sorter ability is working, when [for which a sorter 220 is discharged in order by trays 2202-2208] the sort function is not working, it operates to the appearance fundamentally discharged by the top tray 2201 like.

[0026] Then, how to output the image read one by one to both sides of one sheet of output form is explained. Once, the conveyance sense of after conveyance and a form is reversed to a delivery unit 208, and the output form to which it was fixed in the fixing section 207 is conveyed in the transferred paper loading section 210 for re-feeding through the conveyance direction change member 209. Since paper will be fed from the transferred paper loading section 210 for

re-feeding about a transfer paper although a manuscript image is read like the above-mentioned process if the following manuscript is prepared, the manuscript image of two sheets can be outputted to the front face of the same output paper, and a rear face after all.

[0027] Drawing 4 is the block diagram of a control unit 300. In drawing 4, 301 is a display and displays operating state and a message. Moreover, it is a touch panel transparent in the front face of a display 301, and works as a selection key by touching a front face. 302 is a ten key and is a key which inputs the number of copies etc. 303 is a start key and actuation is started from pressing this key.

[0028] Next, actuation is explained using the flow chart of drawing 5.

[0029] In the case of an external device and this operation gestalt, this program expresses the operating state of a host computer 900.

[0030] First, the acknowledge signal of a situation of operation is required of image formation equipment 100 from a host computer 900 (step S501). If it can shift to the condition in rewriting mode and image formation equipment 100 will judge at this time, that condition will be displayed on a control unit 300. The information on the purport which image formation equipment 100 rewrote and shifted to the mode is transmitted to a host computer 900. A host computer 900 receives this, requires the model ID number of image formation equipment 100 (step S502), and receives Model ID. A host computer 900 judges whether the model of this model ID number (information on the purport which is a copying machine with an operation gestalt), and control program which should be transmitted has agreed (step S503). If it has not agreed, a control program transfer disapproval signal (step S512) and disapproval level (what shows whether it became impossible in which phase to transmit) are transmitted to image formation equipment 100 through a communication circuit 901 (step S513). If image formation equipment 100 receives this information, a message to that effect will be displayed on a control unit 300. Moreover, a host computer transmits a rewriting mode terminate signal (step S515), and tells image formation equipment 100 about termination in rewriting mode.

[0031] On the other hand, when it is judged at step S503 that it agreed, the functional ID number of image formation equipment 100 is required (step S505). In the case of the image formation equipment 100 of an operation gestalt, ID information on a purport that it functions as an image scanner and a printer will be sent out.

[0032] A host computer 900 receives this, and when having not agreed, it processes steps S512-S514 shown previously. Moreover, when it agrees, the version of the control program which current and image formation equipment 100 are using is required (step S508). If new in whether it is the same as the control program version which the transmitted version transmits after this, since it is not necessary to transmit, steps S512-S514 are processed.

[0033] Moreover, when it is judged that a version is old, a transfer of a control program is performed (step S511). After a transfer of a control program finishes, a rewriting mode terminate signal is transmitted to image formation equipment 100 (step S515), and it displays that rewriting was completed on the control unit 300 of image formation equipment 100, and changes into the normal mode.

[0034] Next, the actuation in the body 100 of image formation equipment in an operation gestalt is explained. In addition, the program for performing this actuation is stored in ROM404.

[0035] The body 100 of image formation equipment is always waiting for the directions from a host computer 900. Here, if rewriting mode directions information is received (step S601), processing will progress to step S602 and operating state will be checked by the operating state detecting element 900 within the body 100 of image formation equipment (step S602).

[0036] If it is judged that it may rewrite from the operating state detecting element 500, and you may shift to the mode, it will indicate that it rewrites to a control unit 300 and shifts to the mode (step S603), and many functions of image formation equipment 100 will be suspended (step S604).

[0037] In addition, when the shift to rewriting mode cannot be performed, for example, or it is under printing from the case where it is [present copy] under processing, and another host computer, it is a case working as image scanner equipment etc.

[0038] Now, it transmits having shifted to rewriting mode to a host computer 900 through the

above actuation (step S605). With, in order to perform trailer substitute actuation, the rewriting program separately memorized by ROM404 is started (step S606).

[0039] After this, it will operate in order to perform communication with the host computer 900 explained by drawing 5 explained previously.

[0040] As explained above, according to this operation gestalt, by judging the model of equipment of the destination, a function, and a version by the ID number, it can mistake and a control program can be transmitted now that there is nothing.

[0041] Moreover, since checking a model and a function in a high order equipment side will be performed without image formation equipment transmitting Model ID when a control program is received, the control program received in that case is not rewritten.

[0042] With the <operation gestalt of ** 2nd> above-mentioned implementation gestalt (1st operation gestalt), although it judged whether it was the object which can transmit image formation equipment 100 by the host computer 900 side, the example which gives this judgment to the image formation equipment 100 side is explained as 2nd operation gestalt. However, an equipment configuration is made into the same thing as the 1st operation gestalt, and the explanation is omitted.

[0043] It is same to start the rewriting program finally stored in ROM404 also with the 2nd operation gestalt from the host computer 900 according to the procedure shown in drawing 6 when the rewriting mode signal was received. Therefore, below, the contents of processing of this rewriting program are explained.

[0044] Drawing 7 is a flow chart which shows the procedure of the rewriting program in the 2nd operation gestalt.

[0045] First, in order to judge what kind of things the model ID number of the control program which the host computer 900 is going to transmit after this when the program of the rewriting program in ROM404 starts, a functional ID number, and a version ID number are, the transfer request is transmitted to a host computer 900 (steps S701, S704, and S707). consequently, the seed information (model ID) and functional information (function ID) that the program which it is going to transmit from a host computer 900 can be adapted -- version information is sent further. And it judges whether the model ID of such information and self and Function ID which have been sent, and the program which is going to investigate in order of a version further, and is going to go, and a host computer 900 tends to transmit can suit self, and it should update further. In discernment of a version, it differs from the 1st operation gestalt explained previously, namely, the same ** as the control program version in which the control program which it is going to transmit is carrying out current use -- when old, a transfer disapproval signal (step S710) and disapproval level (step S712) are transmitted to a host computer 900. Also in the body 100 of image formation equipment, it combines that a transfer is impossible with a control unit 300 with disapproval level, and displays (step S712).

[0046] When all the above decision is cleared, a control program transfer is required of a host computer (step S713). And a flash memory is rewritten as it is also with the sent control program (step S714). It rewrites at the end, a mode terminate signal is transmitted to a host (step S715), and it rewrites to a control unit 300, and mode termination is displayed (step S716) and it ends (step S710).

[0047] A control program is transmitted with the above actuation. Although adjustment of the control program which should be transmitted from the position of a host computer 900, and the body 100 of image formation equipment was performed with the 1st operation gestalt, it is the description with the operation gestalt 2 to process in the position of the body 100 of image formation equipment.

[0048] In addition, with the above-mentioned operation gestalt, although target equipment considers as a copying machine, the invention in this application may not be limited by this, and an image scanner, a printer, facsimile apparatus, etc. may be what kind of things. Moreover, with an operation gestalt, although the host computer was made into the example as an external device, the invention in this application is not limited by this, either. Furthermore, although the operation gestalt explained the example which connects two equipments with serial interface (RS-232C) again, of course, it is good also as communication between two equipments under the

environment where connect the communication configuration not only through this but through the network, and the equipment of three or more equipments was connected.

[0049] <Operation gestalt of ** 3rd> drawing 8 is the block diagram showing the configuration of the image formation equipment of the 3rd operation gestalt of this invention. The reader section 1 reads the image of a manuscript and outputs the image data according to a manuscript image to the printer section 2 and image I/O control unit 3. The printer section 2 records the image according to the image data from the reader section 1 and image I/O control unit 3 in the record paper. It connects with the reader section 1 and image I/O control unit 3 consists of the facsimile section 4, the file section 5, the computer interface section 7, the formatter section 8, the image memory section 9, the core section 10, etc.

[0050] Moreover, an external device (for example, host computer) 13 is a thing for upgrading the program of image formation equipment, and is connected with the core section 10 through the telephone line.

[0051] The facsimile section 4 compresses the image data which elongated ***** which received through the telephone line, and transmitted the elongated image data to the core section 10, and was transmitted from the core section 10, and transmits the compressed compression image data through the telephone line. The hard disk 12 is connected to the facsimile section 4, and the image data and the compression image data which received which should transmit can be saved temporarily. The Magnetic–Optical disk drive unit 6 is connected to the file section 5, and the file section 5 compresses the image data transmitted from the core section 10, and is stored in the magneto-optic disk set to the Magnetic–Optical disk drive unit 6 with the keyword for searching the image data. Moreover, the file section 5 searches the compression image data memorized by the magneto-optic disk based on the keyword transmitted through the core 10, reads the searched compression image data, develops, and transmits the elongated image data to the core section 10.

[0052] The computer interface section 7 is an interface between a personal computer or a workstation (PC/WS) 11, and the core section 10. Developing the formatter section 8 to the image data which can record the code data showing the image transmitted from PC/WS11 in the printer section 2, the image memory section 9 memorizes temporarily the data transmitted from PC/WS11. Although later mentioned about the core section 10, the core section 10 controls the data flow between each of the reader section 1, the facsimile section 4, the file section 5, the computer interface section 7, the formatter section 8, and the image memory section 9.

[0053] In addition, the cross-section configuration of the image formation equipment in the 3rd operation gestalt and its activity consider as the same thing as drawing 3, and the explanation is omitted.

[0054] Drawing 9 is the block diagram of the reader section 1. As for the image data outputted from CCD109, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 110. The image data processed by the A/D-SH section 110 is transmitted to the core section 10 of image I/O control unit 3 through the interface section 113 while it is transmitted to the printer section 2 through the image-processing section 111. CPU114 controls the image-processing section 111 and an interface 113 according to the contents of a setting set up by the control unit 126 in the core section 10 mentioned later. For example, when the copy mode which copies by performing trimming processing by the control unit 126 is set up, the information is passed to CPU114 through an interface 113 from the core section 10. And trimming processing is made to perform in the image-processing section 111, and it is made to transmit to the printer section 2. Moreover, when the facsimile transmitting mode is set up by the control unit 126, image data and the control command according to the set-up mode are made to transmit to the core section 10 from an interface 113. The control program of such CPU114 is memorized by memory 116, and CPU114 controls, referring to memory 116. Moreover, memory 116 is used also as a working area of CPU114.

[0055] Drawing 10 is the block diagram of the core section 10. While the image data from the reader section 1 is transmitted to the data-processing section 121, the control command from the reader section 1 is transmitted to CPU123. The data-processing section 121 performs image processings, such as rotation processing of an image and variable power processing, and the

image data transmitted to the processing section 121 from the reader section 1 is transmitted to the facsimile section 4, the file section 5, and the computer interface section 7 through an interface 120 according to the control command transmitted from the reader section 1. Moreover, the code data showing the image inputted through the computer interface 7 are transmitted to the back formatter section 8 transmitted to the data-processing section 121, it is developed by image data, and after this image data is transmitted to the data-processing section 121, it is transmitted to the printer section 2 through the facsimile section 4 or the reader section 1. After the image data from the facsimile section 4 is transmitted to the data-processing section 121, it is transmitted to the printer section 2, the file section 5, and the computer interface section 7. Moreover, after the image data from the file section 5 is transmitted to the data-processing section 121, it is transmitted to the printer section 2, the facsimile section 4, and the computer interface section 7. CPU123 performs such control according to the control program memorized by memory 124 and the control command transmitted from the reader section 1. Moreover, memory 124 is used also as a working area of CPU123. Thus, it is possible to perform processing which compounded functions, such as reading of a manuscript image, a print of an image, transmission and reception of an image, preservation of an image, and I/O of the data from a computer, focusing on the core section 10. Interfaces 125 are interfaces for external device connection, such as RS232C used for version up, and are connected with an external device through the telephone line by drawing 8.

[0056] Drawing 11 shows the detail of the memory section 124 in the core section 10. The program for CPU123 to carry out various processing actuation of the flash ROM 503 is stored. RAM501 is used as the backup data storage of the core section 10, and a working-level month RAM of CPU124. Another program for EPROM502 to realize the minimum function of a control unit and copy actuation among the functions as the core section is stored. With this operation gestalt, in copy actuation, it considers only as an one side copy and the control unit is also supporting only the function.

[0057] Drawing 12 shows the configuration of the program in a flash ROM 503. The flash ROM 503 is divided into the block of 16 by all that are shown by 0-15, and can perform rewriting per block. The down program used in case a flash ROM 503 is rewritten for block 0 is stored. In addition, the block 0 has composition whose rewriting is impossible in hard. The flash ROM currently used with this operation gestalt has two, the normal mode and a write mode, and is the thing of a configuration of that data cannot be read from a flash ROM in a write mode. flash ROM rewriting [in / the sake / this operation gestalt] — if working, the download program of block 0 is transmitted to RAM501, and the flash ROM is rewritten.

[0058] Block 1 is a module which performs I/F control of the reader section, and block 2 is a module which controls the data-processing section. Block 3 is a module which controls the printer section, and block 4 is a module which controls I/F of FAX. Moreover, the module with which block 5 performs I/F control of FILE, the module with which block 6 controls I/F of a computer, and block 7 are modules which control other I/F.

[0059] Block 8 is a module which controls the common setting item of a control unit, and this block is the software relevant to all actuation. Block 9 is a module which controls a copy control unit. Block 10 is a module which controls the control unit of facsimile. Block 11 is a module which controls the control unit of a file. Block 12 is a module which controls the control unit of a printer. Moreover, for the moment, blocks 13-15 are secured to reserves.

[0060] Since it directs which part (program module) the external communication equipment 13 upgrades by the communication link between an external instrument 13 and a core 10, a core 10 can know which block is upgraded. Here, the procedure in the case of rewriting the program of the block 11 (file manipulation program module) in drawing 12 is explained according to the flow chart of drawing 13.

[0061] in addition, the program based on the flow chart of this drawing — the connection request from an external device 13 — it is — in addition — and it is started when the directive command of a purport which rewrites is received.

[0062] First, it waits until image formation equipment confirms whether to be in the rewritable conditions under copy, before a wait rise, etc. and becomes possible at step S1. Moreover, when

it is judged that it is in a rewritable condition, it progresses to step S2, a flash ROM is set as rewriting mode, and the program of block 0 is transmitted to RAM501.

[0063] Subsequently, the rewriting program on RAM501 is performed in step S3. In step S4, it is confirmed whether rewriting of a program was successful for every constant-rate unit of a certain. With this operation gestalt, the comparison with the data received the checksum sent from an external device 13 using a checksum and now is performed. When a checksum is in agreement, it confirms whether to be rewriting termination at step S5 (for example, a ***** [having received the command of the purport which transmission of rewriting data ended] -- or the command which shows the amount of data which should be transmitted first is received, and it judges by whether the reception was completed). When having not ended yet, sequential execution of the return rewriting is carried out to step S3. In this way, if rewriting is completed, it progresses to step S6, and from rewriting mode, a flash ROM will be made to shift to the normal mode, and it will end.

[0064] On the other hand, when rewriting fails in step S4, it progresses to step S7 and detects of which block rewriting went wrong. With this operation gestalt, since it is failure of block 11, what the block 11 (file manipulation section) went wrong is detected. Next, it progresses to step S8, file-related software activation is stopped, and it returns to step S6.

[0065] The control unit display by the normal mode is shown in drawing 14, and the actuation is explained below. The display shown in drawing 14 is a key currently displayed in software on the liquid crystal display screen of the control unit prepared in this equipment. 801 is an extended key, and if this key is pressed, it will change to the display for performing a double-sided copy key etc. 802 is an image mode key, and when performing image processings, such as reversal and italic, it is used. 803 is the user mode key which a user can define. 804 is a key used when setting up in-every-direction independent variable power etc. 805-807 are mode memory keys, and an operator makes the mode frequently used to these keys register, and it makes it possible to exclude two or more setup as at least one key stroke is.

[0066] 808 is a call key, and when calling back the mode in front of actuation, it is used. 809 is an option key and is a key used when the option is set up. 810 is a key used when using a sorter. 811 is a key used when specifying manuscript mixed-loading mode. 812 is a key which sets up a scale factor to 100%. 813,814,815 is a key used at the time of the variable power of fixed form expansion, fixed form contraction, and 1% unit, respectively. 816 is a form selection key. 817 is a display which shows concentration and displays the degree of the concentration as level by actuation of the key used for modification of the concentration of 818,819. 820 is a key which sets up automatic exposure. 821 is a key used when reproducing a photograph manuscript finely. 822 is a key used when reproducing the alphabetic character of an alphabetic character manuscript to Sharp more.

[0067] Moreover, 823 is a Help key for giving various explanation etc. 824 is a key pressed when using it as copy mode. That is, drawing 14 is a screen which displays that it is pushed by the key 824. 825 is a key pressed when using it as facsimile mode. 826 is a key pressed when using it as a file mode. 827 is a key pressed when using it as printer mode (that is, this equipment functions also as a usual printer in response to the print data from a host computer).

[0068] Now, when rewriting of a program is successful, the control unit of image formation equipment becomes like drawing 14. On the other hand, when rewriting (download) of the control unit program of a file goes wrong as explained previously for example, it becomes the display shown in drawing 15. That is, the key 826 which sets up a file mode will be lost. File-related actuation will be forbidden by these 826 keys being lost. Furthermore, a message called version up failure of the file section is outputted. Although illustration is not carried out, since version up failure is indicated also like the external device 13, although it is natural also to a serviceman, you are told about.

[0069] The detailed block diagram of steps S7 and S8 shown in drawing 16 by drawing 13 is shown.

[0070] First, the key which judges the block which went wrong at step S11, chooses the function corresponding to step S12-15, and can choose the function at step S16 is deleted from a control unit. Usually, the software of a screen is contained [control unit / of block 8].

[0071] Next, explanation when rewriting goes wrong in the control unit common software of block 8 among the blocks shown in drawing 12 is given. Since fundamental actuation is the same as the above, explanation is omitted.

[0072] now, the step [in / in the processing in this case / drawing 13] S -- seven differ from eight. Then, this part is explained according to the flow chart of drawing 17.

[0073] Since rewriting of control unit common software went wrong, the contents of the block which it progressed to step S11 and went wrong are checked in the block relevant to all actuation. If not in agreement, it progresses to step S11 of drawing 16, and a correspondence key is deleted and it progresses to step S6. On the other hand, when in agreement, it sets up and returns to step S6 so that it may progress to 22 and software may be performed by RAM502.

[0074] The flow chart of processing of the whole equipment of operation is shown in drawing 18, and it explains below.

[0075] At step S31, it judges whether it is ROM actuation. When ROM actuation is not specified (i.e., when performing normal operation), it progresses to step S32 and the program on 503 flash ROMs is performed. At step S33, it is confirmed whether the mode was set up by the control unit and the operational request occurred. When an operational request does not occur, it will wait at step S33.

[0076] For example, suppose that a setup called five copies of variable power was performed 70%, and the copy operational request occurred. In this case, copy actuation is performed on the conditions set up at step S34, and it returns to step S31.

[0077] On the other hand, as drawing 12 explained at step S31, when ROM actuation is set up, it branches to step S35, and the program on EPROM502 is performed. As mentioned above, with this operation gestalt, it considers only as the one side copy in copy actuation, and the program to which a control unit also supports only the function is carried in EPROM502. Subsequently, it waits for a copy operational request to occur at step S36. If it generates, it will progress to step S37, copy actuation will be performed, and it will return to step S31. The display screen of the control unit at that time is shown in drawing 19. It turns out that only a copy actual size one side copy is made. Furthermore, since download went wrong, the message of operating by the minimum function is outputted. What download went wrong is told although it is natural also to a serviceman, since it is displayed also like the external device (not shown).

[0078] With an operation gestalt, although the copy actuation minimum function is carried on 502EPROM, this may be facsimile, a printer, and the minimum function of a file.

[0079] <the 4th operation gestalt> -- the 4th operation gestalt is explained. Drawing 20 is the block diagram showing the configuration of the 4th operation gestalt.

[0080] In illustration, the same sign was attached about the same configuration as drawing 1 explained previously. However, the control section 400 in the operation gestalt of **** 4 carries out motion control based on the program which thaws the motion control of image formation equipment 100, rewriting control of memory, the communications control that communicates with a data control communication device, and the compressed data. Moreover, 901 is a communication circuit which connects image formation equipment 100 to a host computer 900, and RS-232C is used for it here.

[0081] Drawing 21 is the block diagram showing the detail configuration of the above-mentioned control section 400. The illustration smell also gave the same sign to the same configuration as drawing 2. Therefore, 401 is CPU which controls image formation equipment 100, and 402 is a flash memory here in nonvolatile memory rewritable on the electric target which memorizes a control program and the information on data rewritten. 403 is RAM used as the field and working storage of input data. A program for 404 to rewrite a flash memory 402 (program corresponding to each flow chart mentioned later), It is ROM which memorizes the program which thaws the compressed data program, 410 is an I/O interface which communicates with the data control communication device 9, and 408 and 409 are the address buses and data buses of CPU401.

[0082] Thus, the data program which rewrites a host computer 900 with the operation gestalt of **** 4 makes compress, it transmits in the image-formation equipment 100 and the host computer 900 which were constituted, and image-formation equipment 100 rewrites the data

which received this through the I/O interface 401, thawed the program based on the program which thaws the data program into which ROM404 of a control section 400 was compressed, and were thawed by the flash memory 402 of a control section 400.

[0083] Furthermore, it judges whether the time amount of rewriting is early, and the way which compressed and performed the data transfer from this defrosting time amount etc. in the number of data of the data which rewrite a host computer 900, and image formation equipment 100 adds also performing actuation based on the decision. The time amount of rewriting here is time amount including a data transfer, compression, defrosting, etc.

[0084] In addition, structure of image formation equipment 100 is made into the same thing as drawing 3 shown with the 1st previous operation gestalt, and explanation here is omitted.

[0085] Now, the data which a host computer 900 has and to rewrite, and the data which are memorized by the flash memory 402 of image formation equipment 100 and which are rewritten consist of 16 blocks also in the operation gestalt of **** 4. Since said flash memory 402 is rewritable per block, the data by the side of a body are compared with the data by the side of a host, and only a conflicting block can rewrite. If there is little block count to rewrite when rewriting under such a premise, the effectiveness of the time amount which requires the way which did not compress the data to rewrite but was transmitted to image formation equipment 100 as it was for rewriting is sometimes good. Therefore, the block count to rewrite, the communication link time amount of data, and the defrosting time amount of the data by the side of image formation equipment can be judged with image formation equipment 100 and a host computer 900, and more effective data can be rewritten by adding decision whether data are compressed and transmitted to a host computer.

[0086] Next, actuation is explained using the flow chart of drawing 22. The flow chart of the program by the side of the host computer 900 at the time of judging whether drawing 22 compresses and transmits a program is shown.

[0087] First, to image formation equipment 100, the SEND statement of the checksum for every whole block of the flash ROM in image formation equipment is transmitted (S401), and it waits for reception of the checksum from image formation equipment 100 (S402). It detects which block should change from the received checksum after receiving this notice, and the block count to rewrite and the amount of data of a program are computed. The time amount which transmits the time amount and program data which are applied to compression and defrosting from the computed program amount of data is computed (S403).

[0088] In the host computer's 900 having data of / (program amount of data) here beforehand (time amount which it takes when program data are transmitted as it was), comparing the data with said computed data of time amount, and rewriting program data, it judges that it is [rewriting] quicker whether to compress and transmit program data (S404). And if judged as no by this decision, a rewriting instruction will be transmitted to image formation equipment 100 (S405), and it will transmit to image formation equipment in a form as it is, without compressing into program data (S406).

[0089] When it is judged that it is earlier to transmit compressed data on the other hand, a compression move instruction is transmitted to image formation equipment 100 (S407), the program data to rewrite are compressed (S408), a rewriting instruction is transmitted to image formation equipment (S409), and the compressed program data is transmitted to image formation equipment (S410).

[0090] Next, the actuation by the side of image formation equipment is explained using the flow chart of drawing 5.

[0091] First, it has a checksum SEND statement from a host computer 900 (S510), and the checksum of each block of the program data memorized in it by the flash memory 402 after reception is transmitted to a host computer 900 (S502).

[0092] Subsequently, it waits to receive a compression move instruction or a rewriting instruction at steps S503 and S508.

[0093] Here, when a compression move instruction is received, it waits to receive a rewriting instruction (for the information which shows the rewriting instruction to which block (plurality is good) it is to also be included) next for reception of actual data at waiting (step S504) and step

S505. If data are received, defrosting processing is performed at step S506, and the program code of the directed block will be generated and will be rewritten to a corresponding block (step S507).

[0094] On the other hand, when a mere rewriting instruction is received without receiving a compression move instruction, processing progresses to step S509 from step S508, and processing which writes in the data received in the block location included in the instruction as it is performed (step S510).

[0095] Although it judged whether it would be made to compress by the host computer side with the operation gestalt of the <operation gestalt of ** 5th> above 4th, the operation gestalt of **** 5 explains the case where two or more image formation equipments of each other are connected. That is, it is the example which makes the program to which it was upgraded in one image formation equipment reflect in other image formation equipments.

[0096] In this case, a system configuration is as being shown in drawing 24 . That is, image formation equipment 500 is equivalent to the host computer of the operation gestalt of the above 4th, and image formation equipment 100 updates the flash ROM of the self which received the program.

[0097] It seems that the processing by the side of the image formation equipment 500 which is an informer is received according to the flow chart of drawing 25 , it comes out, and the processing by the side of a certain image formation equipment 100 is shown in the flow chart of drawing 26 although it is a communication procedure. like illustration -- an informer -- and by winning popularity, since the near contents of processing are substantially [as the operation gestalt of the above 4th] the same, the explanation is omitted.

[0098] When suited under the environment where two or more image formation equipments were connected according to the operation gestalt of **** 5, it becomes possible for other image formation equipments to make an own program update automatically one after another only by rewriting an internal processing program as the processing explained with the 4th operation gestalt to one image formation equipment is also.

[0099] In addition, even if it applies this invention to the system which consists of two or more devices (for example, a host computer, an interface device, a reader, a printer, etc.), it may be applied to the equipments (for example, a copying machine, facsimile, etc.) which consist of one device.

[0100] Moreover, being attained does not have that until it says by the purpose of this invention supplying the storage which memorized the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and reading and performing the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage, either.

[0101] In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.

[0102] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, etc. can be used, for example.

[0103] Moreover, it cannot be overemphasized by performing the program code which the computer read that it is contained also when the function of the operation gestalt mentioned above is not only realized, but it performs a part or all of processing that OS which is working on a computer is actual, based on directions of the program code and the function of an operation gestalt is realized by the processing.

[0104] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the extension board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a block diagram explaining the configuration of the image formation equipment in the 1st operation gestalt, and a host computer.

[Drawing 2] It is a block diagram explaining the detail configuration of the control section in an operation gestalt.

[Drawing 3] It is the cross-section block diagram of the image formation equipment in an operation gestalt.

[Drawing 4] It is a top view explaining the configuration of the control unit in an operation gestalt.

[Drawing 5] It is the flow chart which shows the activation procedure of the host computer in the 1st operation gestalt.

[Drawing 6] It is the flow chart which shows the procedure in the image formation equipment in the 1st operation gestalt.

[Drawing 7] It is the flow chart which shows the operations sequence in the image formation equipment in the 2nd operation gestalt.

[Drawing 8] It is drawing showing relation with the image formation equipment and the host computer in the 3rd operation gestalt.

[Drawing 9] It is the block diagram of the reader section 1 in the 3rd operation gestalt.

[Drawing 10] It is the block diagram of the core section 10 in the 3rd operation gestalt.

[Drawing 11] The detail of the memory section 124 of **drawing 10** is shown.

[Drawing 12] The configuration of the program in the flash ROM in the 3rd operation gestalt is shown.

[Drawing 13] It is the flow chart which shows the procedure of rewriting the program in the 3rd operation gestalt.

[Drawing 14] It is drawing showing the example of the display screen of the control unit in a normal state.

[Drawing 15] It is drawing showing the example of the display screen in the condition of having become impossible about the function a part.

[Drawing 16] It is the flow chart which shows the detail of steps S7 and S8 in **drawing 13**.

[Drawing 17] It is the flow chart which shows a part of processing in the 3rd operation gestalt.

[Drawing 18] It is the flow chart which shows the procedure of the whole image formation equipment in the 3rd operation gestalt.

[Drawing 19] It is drawing showing the example of the display screen at the time of the download failure in the 3rd operation gestalt.

[Drawing 20] It is the block diagram showing the configuration of the 4th operation gestalt.

[Drawing 21] It is the block diagram showing the detail configuration of the control section in the 4th operation gestalt.

[Drawing 22] It is the flow chart which shows the contents of processing of the host computer in the 4th operation gestalt.

[Drawing 23] It is the flow chart which shows the contents of processing by the side of the image formation equipment in the 4th operation gestalt.

[Drawing 24] It is the block diagram showing the configuration of the 5th operation gestalt.

[Drawing 25] It is the flow chart which shows the contents of processing of the image processing system by the side of the program supply in the 5th operation gestalt.

[Drawing 26] It is the flow chart which shows the contents of processing by the side of the image formation equipment by the side of the program sink in the 5th operation gestalt.

[Description of Notations]

100 Image Formation Equipment

300 Control Unit

400 Control Section

401 CPU

402 Flash Memory

403 RAM

404 ROM

410 I/O Interface

900 Host Computer

[Translation done.]

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[Item(s) to be Amended] Claim 16

[Method of Amendment] Modification

[Proposed Amendment]

[Claim 16] It is an information processor given in the 15th term of a claim characterized by judging any of said 1st and 2nd format said 1st and 2nd formats are equivalent to compressed format and an incompressible format, and it is made based on the capacity of the program information which should transmit said 2nd decision means and pressing time, transmission speed, and the defrosting rate in low order equipment.

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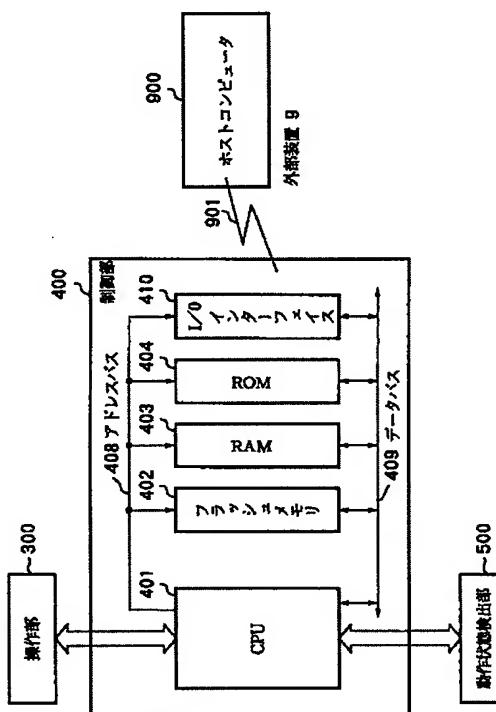
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(54)【発明の名称】 情報処理装置及びその制御方法

(57)【要約】

【課題】 確実に動作することが約束されたプログラムでもって、その機能を向上させることを可能にする。

【解決手段】 ホストコンピュータ900は、I/Oインターフェース410を介して如何なる機種か、如何なる機能を有するのか、更には、フラッシュメモリ402に記憶保持されているプログラムのバージョンがいくつかを問い合わせる命令を送出する。これを受け、CPU401は、指定された情報をホストコンピュータ900に返す。ホストコンピュータ900は、アップデートしようとするプログラムとして正しい機種か否か、更には、古いバージョンを使用しているか否かを判定する。そして、正しい機種であり、古いバージョンを使用していると判断したときに、そのプログラムを送信し、フラッシュメモリ402に格納させる。



【特許請求の範囲】

【請求項 1】 上位装置と相方向通信可能で、前記上位の装置から送られてくるプログラム情報でもって、自身のプログラムを更新する情報処理装置であって、

前記上位装置からの所定の要求に従い、自身の機種及び機能についての情報を上位装置に送信する送信手段と、該送信手段によって前記自身の機種及び機能についての情報を送信した後に、前記上位装置からプログラム情報を受信した場合、当該プログラム情報を記憶保持する記憶保持手段とを備えることを特徴とする情報処理装置。

【請求項 2】 前記送信手段は、更に、自身のプログラムのバージョン情報をも送信することを特徴とする請求項第1項に記載の情報処理装置。

【請求項 3】 上位装置と相方向通信可能で、前記上位の装置から送られてくるプログラム情報でもって、自身のプログラムを更新する情報処理装置の制御方法であって、

前記上位装置からの所定の要求に従い、自身の機種及び機能についての情報を上位装置に送信する送信工程と、該送信工程によって送信した後に、前記上位装置からプログラム情報を受信した場合に、当該プログラム情報を記憶保持する記憶保持工程とを備えることを特徴とする情報処理装置の制御方法。

【請求項 4】 前記送信工程は、更に、自身のプログラムのバージョン情報をも送信することを特徴とする請求項第3項に記載の情報処理装置の制御方法。

【請求項 5】 下位に接続された電子機器と相方向通信可能で、下位の電子機器内のプログラム情報を管理する情報処理装置であって、

前記下位に接続された電子機器の機種及び機能を認識する認識手段と、

該認識手段の認識結果と、送信しようしているプログラムの対象が一致するか否かを判断する判断手段と、該判断手段によって一致すると判断した場合に、前記プログラム情報を下位の電子機器に送信し、記憶保持させる手段とを備えることを特徴とする情報処理装置。

【請求項 6】 前記認識手段は、更に、下位に接続された電子機器内のプログラムのバージョン情報を認識することを特徴とする請求項第5項に記載の情報処理装置。

【請求項 7】 下位に接続された電子機器と相方向通信可能で、下位の電子機器内のプログラム情報を管理する情報処理装置の制御方法であって、

前記下位に接続された電子機器の機種及び機能を認識する認識工程と、

該認識工程の認識結果と、送信しようしているプログラムの対象が一致するか否かを判断する判断工程と、該判断工程によって一致すると判断した場合に、前記プログラム情報を下位の電子機器に送信し、記憶保持させる工程とを備えることを特徴とする情報処理装置の制御方法。

【請求項 8】 前記認識工程は、更に、下位に接続された電子機器内のプログラムのバージョン情報を認識することを特徴とする請求項第7項に記載の情報処理装置の制御方法。

【請求項 9】 上位装置から送られてくる制御プログラムを受信し、当該プログラムを機能拡張プログラムとして実行処理する情報処理装置であって、

基本動作を行うプログラムを記憶した第1の記憶手段と、

前記制御プログラムを格納するための書き込み可能で不揮発性の第2の記憶手段と、

前記上位装置から送られてくる制御プログラムを正常に受信できなかった場合に、前記第2の記憶手段に格納されたプログラムの該当する機能を不能にして前記第1の記憶手段及び以前に第2の記憶手段に正常に格納されたプログラムの組合せる制御手段とを備えることを特徴とする情報処理装置。

【請求項 10】 上位装置から送られてくる制御プログラムを受信し、当該プログラムを機能拡張プログラムとして所定の書き込み可能な不揮発性記憶手段に格納し、実行処理する情報処理装置の制御方法であって、

前記上位装置から送られてくる制御プログラムを正常に受信できなかった場合に、前記不揮発性記憶手段に格納されたプログラムの該当する機能を不能にし、既存の基本プログラムを記憶している所定の記憶手段、及び、前記不揮発性記憶手段に以前に正常に格納されたプログラムの組合せて処理を行うよう制御することを特徴とする情報処理装置の制御方法。

【請求項 11】 上位装置と相方向通信可能で、前記上位の装置から送られてくるプログラム情報でもって、自身のプログラムを更新する情報処理装置であって、

前記上位装置からの所定の要求に従い、自身が所有している制御プログラムの特徴情報を上位装置に送信する送信手段と、

該送信手段によって送信した後に、前記上位装置から送られてきた情報を受信し、当該受信した情報の形式に従い、受信情報を制御プログラムとして登録する登録手段とを備えることを特徴とする情報処理装置。

【請求項 12】 前記登録手段は、前記受信した情報が圧縮された形式の情報である場合には、当該情報を解凍して登録し、非圧縮形式であればそのまま所定の書き込み可能な不揮発性記憶手段に書き込むことを特徴とする請求項第11項に記載の情報処理装置。

【請求項 13】 上位装置と相方向通信可能で、前記上位の装置から送られてくるプログラム情報でもって、自身のプログラムを更新する情報処理装置の制御方法であって、

前記上位装置からの所定の要求に従い、自身が所有している制御プログラムの特徴情報を上位装置に送信する送信工程と、

該送信工程によって送信した後に、前記上位装置から送られてきた情報を受信し、当該受信した情報の形式に従い、受信情報を制御プログラムとして登録する登録工程とを備えることを特徴とする情報処理装置の制御方法。

【請求項14】前記登録工程は、前記受信した情報が圧縮された形式の情報である場合には、当該情報を解凍して登録し、非圧縮形式であればそのまま所定の書き込み可能な不揮発性記憶手段に書き込むことを特徴とする請求項第13項に記載の情報処理装置の制御方法。

【請求項15】下位に接続された電子機器と相方向通信可能で、下位の電子機器内のプログラム情報を管理する情報処理装置であって、前記下位に接続された電子機器が所有している複数の制御プログラムのうち、どの制御プログラムを更新すべきかを判断する第1の判断手段と、該判断手段の判断結果に基づいて、下位の電子機器に送信すべきプログラムを第1の形式で送信するか、第2の形式で送信するかを判断する第2の判断手段と、該第2の判断手段の判断結果に基づく形式で前記プログラムを送信し、下位の装置に記憶保持要求を行う制御手段とを備えることを特徴とする情報処理装置。

【請求項16】前記第1及び第2の形式は、圧縮形式と非圧縮形式に対応し、前記第2の判断手段は送信すべきプログラム情報の容量及び圧縮時間、通信速度、下位装置における解凍速度に基づいて、前記第1、第2の形式のいずれにするかを判断することを特徴とする請求項第8項に記載の情報処理装置。

【請求項17】下位に接続された電子機器と相方向通信可能で、下位の電子機器内のプログラム情報を管理する情報処理装置の制御方法であって、前記下位に接続された電子機器が所有している複数の制御プログラムのうち、どの制御プログラムを更新すべきかを判断する第1の判断工程と、該判断工程の判断結果に基づいて、下位の電子機器に送信すべきプログラムを第1の形式で送信するか、第2の形式で送信するかを判断する第2の判断工程と、該第2の判断工程の判断結果に基づく形式で前記プログラムを送信し、下位の装置に記憶保持要求を行う制御工程とを備えることを特徴とする情報処理装置の制御方法。

【請求項18】前記第1及び第2の形式は、圧縮形式と非圧縮形式に対応し、前記第2の判断工程は送信すべきプログラム情報の容量及び圧縮時間、通信速度、下位装置における解凍速度に基づいて、前記第1、第2の形式のいずれにするかを判断することを特徴とする請求項第17項に記載の情報処理装置の制御方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は情報処理装置及びその制御方法、詳しくは上位装置から供給されるプログラ

ム情報を機能向上プログラムとして使用する、もしくは、下位の装置に機能向上プログラムを供給する情報処理装置及びその制御方法に関するものである。

【0002】

【従来の技術】従来、コンピュータ等のメモリ管理体制は、外部装置と通信媒体とにより画像形成装置を接続し、画像形成装置が有する不揮発性メモリ等に変更すべき制御プログラムの転送を行っている。

【0003】

【発明が解決しようとする課題】しかし、系列化した画像形成装置に於いては、操作者が誤って他の系列装置の制御プログラムを転送したり、画像形成装置内の必要としない機能の制御プログラムを転送してしまい、転送後の画像形成装置に誤動作を引き起こす恐れがある。

【0004】また、特に距離的に十分離れた位置から、機能向上させるためのプログラムを送信している場合であって、その送信に異常が起こると、もはや正常な動作が望めない、もしくは、全く動作しない事態になりかねない。

【0005】更には、大きなサイズのプログラム等を送信する場合に、受け手側の装置がそのプログラムの機能を使用できるようになるまで長い間待たされることになる。

【0006】

【課題を解決するための手段】本発明は、上述の課題を解決することを目的としてなされたものであり、確実に動作することが約束されたプログラムでもって、その機能を向上させることを可能にする情報処理装置及びその制御方法を提供しようとするものである。

【0007】この課題を解決するため、例えば本発明の情報処理装置は以下に示す構成を備える。すなわち、上位装置と相方向通信可能で、前記上位の装置から送られてくるプログラム情報でもって、自身のプログラムを更新する情報処理装置であって、前記上位装置からの所定の要求に従い、自身の機種及び機能についての情報を上位装置に送信する送信手段と、該送信手段によって前記自身の機種及び機能についての情報を送信した後に、前記上位装置からプログラム情報を受信した場合、当該プログラム情報を記憶保持する記憶保持手段とを備える。

【0008】或いは、下位に接続された電子機器と相方向通信可能で、下位の電子機器内のプログラム情報を管理する情報処理装置であって、前記下位に接続された電子機器の機種及び機能を認識する認識手段と、該認識手段の認識結果と、送信しようしているプログラムの対象が一致するか否かを判断する判断手段と、該判断手段によって一致すると判断した場合に、前記プログラム情報を下位の電子機器に送信し、記憶保持させる手段とを備える。

【0009】また、他の発明は、通信中に何等のトラブルが発生しても、そのトラブルの基になったプログラム

の使用を積極的に不能にしつつ、基本的な処理動作を確保する情報処理装置及びその制御方法を提供しようとするものである。

【0010】この課題を達成するため、例えば本発明の情報処理装置は以下の構成を備える。すなわち、上位装置から送られてくる制御プログラムを受信し、当該プログラムを機能拡張プログラムとして実行処理する情報処理装置であって、基本動作を行うプログラムを記憶した第1の記憶手段と、前記制御プログラムを格納するための書き込み可能で不揮発性の第2の記憶手段と、前記上位装置から送られてくる制御プログラムを正常に受信できなかった場合に、前記第2の記憶手段に格納されたプログラムの該当する機能を不能にし、前記第1の記憶手段及び以前に第2の記憶手段に正常に格納されたプログラムの組合せる制御手段とを備える。

【0011】また、本発明の更なる目的は、プログラムのアップデートにかかる時間を効率良く短縮することを可能ならしめる情報処理装置及びその制御方法を提供しようとするものである。このため、以下の構成を備える。の上位装置と相方向通信可能で、前記上位の装置から送られてくるプログラム情報でもって、自身のプログラムを更新する情報処理装置であって、前記上位装置からの所定の要求に従い、自分が所有している制御プログラムの特徴情報を上位装置に送信する送信手段と、該送信手段によって送信した後に、前記上位装置から送られてきた情報を受信し、当該受信した情報の形式に従い、受信情報を制御プログラムとして登録する登録手段とを備える。

【0012】或いは、下位に接続された電子機器と相方向通信可能で、下位の電子機器内のプログラム情報を管理する情報処理装置であって、前記下位に接続された電子機器が所有している複数の制御プログラムのうち、どの制御プログラムを更新すべきかを判断する第1の判断手段と、該判断手段の判断結果に基づいて、下位の電子機器に送信すべきプログラムを第1の形式で送信するか、第2の形式で送信するかを判断する第2の判断手段と、該第2の判断手段の判断結果に基づく形式で前記プログラムを送信し、下位の装置に記憶保持要求を行う制御手段とを備える。

【0013】

【発明の実施の形態】以下、添付図面に従って本発明に係る実施形態の一例を詳細に説明する。

【0014】<第1実施形態>図1は、本発明に関わる一実施形態であるメモリ管理体制の構成例を示す図である。

【0015】図1において、100は画像形成装置本体(実施形態では複写装置とした)、300は画像形成装置100の操作部、400は画像形成装置100の動作制御及びメモリの書き換え制御及び外部装置との通信制御を行う制御部である。また、500は、画像形成装置

100の動作状態を検出する検出部である。また、900は外部装置の1つで、外部から画像形成装置100のメモリ書き換え命令を出すホストコンピュータであり、901は画像形成装置100とのホストコンピュータ900を結ぶ通信回路であり、ここではRS-232Cを用いている。

【0016】図2は、図1で示した制御部400の詳細構成を示すブロック図である。図2において、401は画像形成装置100の制御を行うCPUであり、402は画像形成装置100の制御プログラムを記憶し電気的に書き換え可能な不揮発性メモリで、本実施形態ではフラッシュメモリである。403は入出力データの記憶の領域や作業用記憶領域等として用いるRAMであり、404はフラッシュメモリ402の書き換えるための制御プログラムと画像形成装置100の動作状態を自己判断するプログラムを記録するROMであり、410は外部装置900との通信を行うI/Oインターフェースである。408及び409はアドレスバス及びデータバスである。

【0017】また、画像形成装置100は通常のコピー動作等を行う通常モードとフラッシュメモリ402の書き換えを行う時の書き換えモードを持つものとする。書き換えモードでは書き換えが終了するまで他の動作は受け付けないものとする。

【0018】この様に構成された画像形成装置100において、ホストコンピュータ900から書き換えモード移行命令を送信し、I/Oインターフェース410を介して画像形成装置100が受信すると、制御部400はフラッシュメモリ402に記憶されている動作状態を判断するプログラムに基づいて所定の動作を実行し、画像形成装置100の動作状態を判断する。前記判断結果により画像形成装置100が書き換えられない状態と判断した場合には、書き換え禁止信号をホストコンピュータ900に転送する。

【0019】また、前記において書き換え禁止の状態であってもその状態が解除されると同時に、書き換え可能信号をホストコンピュータ900に送信する。

【0020】さらに、画像形成装置100の書き換えを遠隔地から行うことと考えて、書き換え可能の信号をホストコンピュータ900に送信する前に操作部に設けられた表示部にメッセージを表示し、使用者の許可・不許可の指示を受ける機能も付加できるものとする。

【0021】続いて、ホストコンピュータから書き換えモードの要求に対し、画像形成装置100が許可信号を送信すると、画像形成装置100は自身の機種を表わすID番号と画像形成装置内の複合機能を表わす機能IDとを通信回路901を介してホストコンピュータ900に送信する。これにより、ホストコンピュータ900は、これから転送しようとする制御プログラムが、転送先の装置に合致するか否かを受信した機種ID番号によ

り判断し、合致していなければ制御プログラムの転送を中止する旨の情報を画像形成装置100に転送する。画像形成装置100側では、操作部に転送できなかったことを示すメッセージを表示させる。また、合致しているなら、次に機能を表わす機能ID番号を確認し、合致しなければ転送できなかったことを操作部に表示させる。合致しているならば、ホストコンピュータ900から画像形成装置100に許可信号を通信回路901を介して制御部400に転送し、CPU401によりROM404に記憶されているフラッシュメモリ書き換え動作のプログラムを実行する。異なっていると判断した場合には、制御プログラムの転送をやめ、制御プログラムを転送できないことを制御部400に転送し、画像形成装置本体100の操作部300に表示する。

【0022】図3は、図1に示した画像形成装置本体100の構成を示す断面図であり、以下リーダ部1及びプリンタ部2に分け、構成及び動作について説明する。

【0023】リーダ部1において、原稿給送装置101上に積載された原稿は、1枚づつ順次原稿台ガラス面102上に搬送される。原稿がガラス面（一般にプラテンガラスと呼ばれる）102の所定位置へ原稿が搬送されると、スキヤナ部のランプ103が点灯、かつスキヤナ・ユニット104が移動して原稿を照射する。原稿の反射光はミラー105、106、107、レンズ108を介してCCD109に結像され、ここで光電変換される。変換された電気信号は、画像処理部110（実施形態の制御部400に対応する）に送られる。

【0024】画像処理部110では、各種操作部で設定された画像処理が施される。また、画像メモリを有し画像の出力方向を回転する機能も有している。また、リーダ部1からの信号をプリンタ部2又は外部装置であるホストコンピュータ900へ切り替える機能と、リーダ部1からの信号と外部装置900からの信号のいずれかを選択し、プリンタ部2に接続する働きを行う外部切り替え回路も有する。つまり、実施形態における装置は、ホストコンピュータ900からみれば、イメージスキヤナとしても機能し、且つ、プリンタとしても機能する。

【0025】画像処理部110の外部切り替え回路にてプリンタ部2へ接続された電気信号は、露光制御部201にて変調された光信号に変換された感光体202を照射する。照射光によって感光体202上に作られた潜像は現像器203によって現像される。上記現像の先端とタイミングを併せて転写紙積載部204、もしくは205より転写紙が搬送され、転写部206において上記現像された像が転写される。転写された像は定着部207にて転写紙に定着された後、排紙部208より装置外部に排出される。排紙部208から出力された転写紙は、ソータ220に渡される。ソータ220は、ソータ機能が働いている場合にはトレー2202から2208に順に排出される様に、ソート機能が働いていない場合には

基本的には最上位のトレー2201に排出される様に動作する。

【0026】続いて、順次読み込む画像を1枚の出力用紙の両面に出力する方法について説明する。定着部207で定着された出力用紙を一度排紙部208まで搬送後、用紙の搬送向きを反転して搬送方向切り替え部材209を介して再給紙用被転写紙積載部210に搬送する。次の原稿が準備されると、上記プロセスと同様にして原稿画像が読み取られるが、転写紙については再給紙用被転写紙積載部210より給紙されるので、結局同一出力紙の表面、裏面に2枚の原稿画像を出力することが出来る。

【0027】図4は、操作部300の構成図である。図4において、301は表示部であり、動作状態・メッセージを表示する。また、表示部301の表面には透明なタッチパネルになっていて、表面を触ることにより選択キーとして働く。302はテンキーであり、複写枚数等を入力するキーである。303はスタートキーであり、このキーを押すことより動作を開始する。

【0028】次に、図5のフローチャートを用いて動作を説明する。

【0029】このプログラムは外部装置、本実施形態の場合にはホストコンピュータ900の動作状態を表わすものである。

【0030】はじめに、ホストコンピュータ900から画像形成装置100に動作状況の確認信号を要求する（ステップS501）。このとき、書き換えモードの状態に移行できると画像形成装置100が判断したなら、操作部300にその状態を表示する。画像形成装置100が書き換えモードに移行した旨の情報をホストコンピュータ900に送信する。ホストコンピュータ900はこれを受け、画像形成装置100の機種ID番号の要求を行い（ステップS502）、機種IDを受信する。ホストコンピュータ900は、この機種ID番号（実施形態では複写機である旨の情報）と転送すべき制御プログラムの機種が合致しているかを判断する（ステップS503）。合致していなければ、通信回路901を介して画像形成装置100に制御プログラム転送不許可信号（ステップS512）、不許可レベル（どの段階で転送できなくなったかをしめすもの）を送信する（ステップS513）。画像形成装置100がこの情報を受けると、操作部300にその旨のメッセージを表示させる。また、ホストコンピュータは書き換えモード終了信号を送信し（ステップS515）、書き換えモードの終了を画像形成装置100に知らせる。

【0031】一方、ステップS503で、合致したと判断した場合には、画像形成装置100の機能ID番号を要求する（ステップS505）。実施形態の画像形成装置100の場合、イメージスキヤナ、プリンタとして機能する旨のID情報を送出することになる。

【0032】ホストコンピュータ900は、これを受け、合致していない場合は、先に示したステップS512～S514の処理を行う。また、合致した場合には、現在、画像形成装置100が使用している制御プログラムのバージョンを要求する（ステップS508）。送信されたバージョンがこれから転送する制御プログラムバージョンと同じか新しいものであれば、送信する必要がないので、ステップS512～S514の処理を行う。

【0033】また、バージョンが古いものであることが判断された場合には、制御プログラムの転送が行われる（ステップS511）。制御プログラムの転送が終わると、書き換えモード終了信号を画像形成装置100に送信（ステップS515）し、書き換えが終了したことを画像形成装置100の操作部300に表示し、通常モードに変換する。

【0034】次に、実施形態における画像形成装置本体100における動作を説明する。尚、この動作を行うためのプログラムはROM404に格納されているものである。

【0035】画像形成装置本体100は、常にホストコンピュータ900からの指示をまっている。ここで、書き換えモード指示情報を受信すると（ステップS601）、処理はステップS602に進み、画像形成装置本体100内の動作状態検出部900により動作状態を確認する（ステップS602）。

【0036】動作状態検出部500から書き換えモードへ移行しても良いと判断されると、操作部300に書き換えモードへ移行することを表示（ステップS603）し、画像形成装置100の諸機能を停止する（ステップS604）。

【0037】尚、書き換えモードへの移行ができない場合とは、例えば、現在複写処理中である場合とか、別のホストコンピュータからの印刷中である、もしくはイメージスキャナ装置として動作中の場合等である。

【0038】さて、以上の動作を経て、書き換えモードに移行したことをホストコンピュータ900に送信する（ステップS605）。以後書き換え動作を実行するためにROM404に別途記憶された書き換えプログラムを起動する（ステップS606）。

【0039】これ以降は、先に説明した図5で説明したホストコンピュータ900とのコミュニケーションを行ふべく、動作することになる。

【0040】以上説明したように本実施形態によれば、転送先の装置の機種、機能、バージョンをID番号により判断することにより、誤りなく制御プログラムを転送することができるようになる。

【0041】また、画像形成装置が機種IDを送信することなく、制御プログラムを受信したときは、上位装置側では機種及び機能を確認することを行っていないことになるので、その場合には受信した制御プログラムの書

換えを行なわない。

【0042】<第2の実施形態>上記実施形態（第1の実施形態）では、ホストコンピュータ900側で、画像形成装置100が転送できる対象であるか否かを判定するものであったが、この判定を画像形成装置100側に持たせる例を第2の実施形態として説明する。但し、装置構成は、第1の実施形態と同様であるものとし、その説明は省略する。

【0043】ホストコンピュータ900から、書換えモード信号を受信すると、第2の実施形態でも、図6に示す手順に従い、最終的にROM404に格納された、書き換えプログラムを起動するのは同様である。従って、以下では、この書き換えプログラムの処理内容を説明する。

【0044】図7は、第2の実施形態における書き換えプログラムの処理手順を示すフローチャートである。

【0045】先ず、ROM404内の書き換えプログラムのプログラムが起動することにより、ホストコンピュータ900がこれから転送しようとしている制御プログラムの機種ID番号、機能ID番号、バージョンID番号がいかなるものであるのかを判断するため、その転送要求をホストコンピュータ900に送信する（ステップS701、S704、S707）。この結果、ホストコンピュータ900から送信しようとするプログラムが適応できる種情報（機種ID）、機能情報（機能ID）、更には、バージョン情報が送られてくる。そして、送られてきたこれらの情報と自身の機種ID、機能ID、更にはバージョン順に調べて行き、ホストコンピュータ900が送信しようとするプログラムが自身に適合できるものであるか、更にはアップデートすべきか否かを判断する。バージョンの識別では先に説明した第1の実施形態とは異なる。すなわち、転送しようとしている制御プログラムが現在使用している制御プログラムバージョンと同じが古いものである場合に、転送不許可信号（ステップS710）、不許可レベル（ステップS712）をホストコンピュータ900に送信する。画像形成装置本体100においても、転送ができないことを操作部300に不許可レベルと併せて表示する（ステップS712）。

【0046】以上の判断を全てクリアした場合、制御プログラム転送をホストコンピュータに要求する（ステップS713）。そして、送られてきた制御プログラムでもってフラッシュメモリの書き換えを行う（ステップS714）。最後に書き換えモード終了信号をホストに送信し（ステップS715）、操作部300に書き換えモード終了の表示（ステップS716）をして終了する（ステップS710）。

【0047】以上の動作をもって制御プログラムの転送を行われる。第1の実施形態では、ホストコンピュータ900の立場から転送すべき制御プログラムと画像形成装置本体100の整合を行なったが、実施形態2では、

画像形成装置本体100の立場で処理を行っているのが特徴である。

【0048】尚、上記実施形態では、対象とする装置が複写機としたがこれによって本願発明が限定されるものではなく、例えばイメージスキャナ、プリンタ、ファクシミリ装置等いかなるものであっても良い。また、実施形態では、外部装置としてホストコンピュータを例にしたが、これによっても本願発明が限定されるものでない。更にまた、実施形態では2つの装置をシリアルインターフェース(RS-232C)で接続する例を説明したが、通信形態はこれに限らず、例えばネットワークを介して接続しても良いし、3つ以上の装置の装置が接続された環境下で2つの装置間のコミュニケーションとしても良いのは勿論である。

【0049】<第3の実施形態>図8は、本発明の第3の実施形態の画像形成装置の構成を示すブロック図である。リーダ部1は原稿の画像を読み取り、原稿画像に応じた画像データをプリンタ部2及び画像入出力制御部3へ出力する。プリンタ部2はリーダ部1及び画像入出力制御部3からの画像データに応じた画像を記録紙上に記録する。画像入出力制御部3はリーダ部1に接続されており、ファクシミリ部4、ファイル部5、コンピュータインターフェイス部7、フォーマッタ部8、イメージメモリ部9、コア部10などからなる。

【0050】また、外部装置(例えばホストコンピュータ)13は、画像形成装置のプログラムをバージョンアップする為のものであり、コア部10と電話回線を介し接続されている。

【0051】ファクシミリ部4は電話回線を介して受信した圧画像データを伸長して、伸長された画像データをコア部10へ転送し、又、コア部10から転送された画像データを圧縮して、圧縮された圧縮画像データを電話回線を介して送信する。ファクシミリ部4にはハードディスク12が接続されており、送信すべき画像データ及び受信した圧縮画像データを一時的に保存することができる。ファイル部5には光磁気ディスクドライブユニット6が接続されており、ファイル部5はコア部10から転送された画像データを圧縮し、その画像データを検索するためのキーワードとともに光磁気ディスクドライブユニット6にセットされた光磁気ディスクに記憶させる。又、ファイル部5はコア10を介して転送されたキーワードに基づいて光磁気ディスクに記憶されている圧縮画像データを検索し、検索された圧縮画像データを読み出して伸長し、伸長された画像データをコア部10へ転送する。

【0052】コンピュータインターフェイス部7は、パソコン用コンピュータ又はワークステーション(PC/WS)11とコア部10の間のインターフェイスである。フォーマッタ部8はPC/WS11から転送された画像を表すコードデータをプリンタ部2で記録できる画

像データに展開するものであり、イメージメモリ部9はPC/WS11から転送されたデータを一時的に記憶するものである。コア部10については後述するが、コア部10はリーダ部1、ファクシミリ部4、ファイル部5、コンピュータインターフェイス部7、フォーマッタ部8、イメージメモリ部9のそれぞれの間のデータの流れを制御するものである。

【0053】尚、第3の実施形態における画像形成装置の断面構成及びその動作内容は、図3と同様であるものとし、その説明は省略する。

【0054】図9はリーダ部1のブロック図である。CCD109から出力された画像データはA/D・SH部110でアナログ/デジタル変換が行われるとともに、シェーディング補正が行われる。A/D・SH部110によって処理された画像データは画像処理部111を介してプリンタ部2へ転送されるとともに、インターフェイス部113を介して画像入出力制御部3のコア部10へ転送される。CPU114は後述するコア部10内の操作部126で設定された設定内容に応じて画像処理部111及びインターフェイス113を制御する。例えば、操作部126でトリミング処理を行って複写を行う複写モードが設定されている場合は、その情報はコア部10よりインターフェイス113を介してCPU114に渡される。そして、画像処理部111でトリミング処理を行わせてプリンタ部2へ転送させる。また、操作部126でファクシミリ送信モードが設定されている場合は、インターフェイス113から画像データと設定されたモードに応じた制御コマンドをコア部10へ転送させる。このようなCPU114の制御プログラムはメモリ116に記憶されており、CPU114はメモリ116を参照しながら制御を行う。また、メモリ116はCPU114の作業領域としても使われる。

【0055】図10はコア部10のブロック図である。リーダ部1からの画像データはデータ処理部121へ転送されるとともに、リーダ部1からの制御コマンドはCPU123へ転送される。データ処理部121は画像の回転処理や変倍処理などの画像処理を行うものであり、リーダ部1から処理部121へ転送された画像データは、リーダ部1から転送された制御コマンドに応じて、インターフェイス120を介してファクシミリ部4、ファイル部5、コンピュータインターフェイス部7へ転送される。また、コンピュータインターフェイス7を介して入力された画像を表すコードデータは、データ処理部121に転送された後フォーマッタ部8へ転送されて画像データに展開され、この画像データはデータ処理部121に転送された後、ファクシミリ部4やリーダ部1を介してプリンタ部2へ転送される。ファクシミリ部4からの画像データは、データ処理部121へ転送された後、プリンタ部2やファイル部5、コンピュータインターフェイス部7へ転送される。また、ファイル部5から

の画像データは、データ処理部121へ転送された後、プリンタ部2やファクシミリ部4、コンピュータインターフェイス部7へ転送される。CPU123はメモリ124に記憶されている制御プログラム、及びリーダ部1から転送された制御コマンドにしたがってこのような制御を行う。また、メモリ124はCPU123の作業領域としても使われる。このように、コア部10を中心に、原稿画像の読み取り、画像のプリント、画像の送受信、画像の保存、コンピュータからのデータの入出力などの機能を複合させた処理を行うことが可能である。インターフェイス125は、バージョンアップに使用するRS232C等の外部装置接続用インターフェースであり、図8では電話回線を介して外部装置と接続されるようになっている。

【0056】図11は、コア部10内のメモリ部124の詳細を示したものである。フラッシュROM503はCPU123が各種処理動作する為のプログラムが格納されている。RAM501はコア部10のバックアップデータの記憶及びCPU124の作業用RAMとして使用している。EPROM502はコア部としての機能の内、操作部、複写動作の最低機能を実現するための別プログラムが格納されている。本実施形態では複写動作では、片面コピーのみとし、操作部もその機能だけをサポートしている。

【0057】図12はフラッシュROM503内のプログラムの構成を示したものである。フラッシュROM503は、0～15で示される全部で16のブロックに分割されており、書換はブロック単位で行える。ブロック0にはフラッシュROM503を書き換える際に使用する、ダウンプログラムが格納されている。尚、ブロック0は、ハード的に書換ができない構成となっている。本実施形態で使用しているフラッシュROMは、通常モードと書き込みモードの2つを有しており、書き込みモードではフラッシュROMからデータを読み出せない構成のものである。その為、本実施形態に於けるフラッシュROM書換動作中ではブロック0のダウンロードプログラムをRAM501へ転送しフラッシュROMの書換を行っている。

【0058】ブロック1はリーダ部のI/F制御を行うモジュールであり、ブロック2はデータ処理部の制御を行うモジュールである。ブロック3はプリンタ部の制御を行うモジュールであり、ブロック4はFAXのI/Fの制御を行うモジュールである。また、ブロック5はFAXのI/F制御を行うモジュール、ブロック6はコンピュータのI/Fの制御を行うモジュール、ブロック7はその他のI/Fの制御を行うモジュールである。

【0059】ブロック8は、操作部の共通設定項目を制御するモジュールであり、このブロックは全ての動作に関連するソフトである。ブロック9はコピー操作部を制御するモジュールである。ブロック10はファクシミリ

の操作部を制御するモジュールである。ブロック11はファイルの操作部を制御するモジュールである。ブロック12はプリンタの操作部を制御するモジュールである。また、ブロック13～15までは今のところ予備用に確保されているものである。

【0060】外部機器13とコア10間の通信にて、外部通信機器13はどの部分（プログラムモジュール）をバージョンアップするかを指示してくるので、コア10は、どのブロックがバージョンアップされているかを知る事ができる。ここで、図12に於けるブロック11（ファイル操作プログラムモジュール）のプログラムの書換を行う場合の手順を図13のフローチャートに従って説明する。

【0061】尚、同図のフローチャートに基づくプログラムは、外部装置13からの接続要求があつて、尚且つ、書換えを行う旨の指示コマンドを受信した場合に起動されるものである。

【0062】先ず、ステップS1にて、画像形成装置がコピー中、ウェートアップ前等の書換可能状態かをチェックし、可能になるまで待つ。また、書換可能状態であると判断した場合には、ステップS2に進み、書換モードにフラッシュROMを設定し、ブロック0のプログラムをRAM501へ転送する。

【0063】次いで、ステップS3において、RAM501上の書換プログラムを実行する。ステップS4では、ある一定量単位毎にプログラムの書換が成功したかをチェックする。本実施形態ではチェックサムを用いて外部装置13から送られてくるチェックサムと現在受け取ったデータとの比較を行っている。チェックサムが一致した場合はステップS5で書換終了かをチェックする（例えば、書換えデータの送信が終了した旨のコマンドを受信したか否か、或いは、はじめに転送すべきデータ量を示すコマンドを受信し、その受信が終了したかで判断する）。まだ終了していない場合は、ステップS3へと戻り書換を順次実行する。こうして、書換が終了したならば、ステップS6へと進み書換モードから通常モードへフラッシュROMを移行させ、終了する。

【0064】他方、ステップS4にて書換が失敗した場合は、ステップS7へと進み、どのブロックの書換が失敗したかを検出する。本実施形態では、ブロック11の失敗であるためブロック11（ファイル操作部）が失敗したことを検知する。次に、ステップS8へと進みファイル関連のソフト実行を中止しステップS6へと戻る。

【0065】図14に通常モードでの操作部表示を示し、以下にその動作を説明する。図14に示される表示は本装置に設けられた操作部の液晶表示画面上にソフト的に表示されているキーである。801は拡張キーであり、このキーを押すと両面コピーキー等を行うための表示に切り替わる。802は画像モードキーであり、反转、斜体等の画像処理を行う時に用いる。803はユー

ザが定義できるユーザモードキーである。804は、縦横独立変倍等を設定する時に使用するキーである。805～807はモードメモリキーであり、操作者はこれらのキーに対して頻繁に使用するモードを登録させ、1つのキー操作でもって複数の設定を省くことを可能にしている。

【0066】808は、コールキーであり操作直前のモードを呼び戻す時に使用する。809はオプションキーであり、オプションが設定されている時に使用するキーである。810はソータを使用するときに使用するキーである。811は、原稿混載モードを指定する時に使用するキーである。812は、倍率を100%に設定するキーである。813, 814, 815はそれぞれ定型拡大、定型縮小、1%刻みの変倍時に使用するキーである。816は用紙選択キーである。817は、濃度を示す表示部であり、818, 819の濃度の変更に用いるキーの操作によってその濃度の度合をレベルとして表示する。820は自動露光を設定するキーである。821は、写真原稿をきれいに再現するときに使用するキーである。822は文字原稿の文字をよりシャープに再現するときに使用するキーである。

【0067】また、823は各種説明等を行うためのヘルプキーである。824はコピー mode として使用する時に押すキーである。つまり図14は、キー824を押されると表示する画面である。825は、ファックスモードとして使用する時に押すキーである。826は、ファイルモードとして使用する時に押すキーである。827は、プリンタモード（すなわち、本装置はホストコンピュータからの印刷データを受けて通常のプリンタとしても機能する）として使用する時に押すキーである。

【0068】さて、プログラムの書換が成功した場合、画像形成装置の操作部は図14の様になる。他方、先に説明したように、例えばファイルの操作部プログラムの書換（ダウンロード）が失敗した場合、図15に示す表示となる。即ち、ファイルモードを設定するキー826がなくなる事となる。この826キーがなくなる事でファイル関連の動作は禁止される事となる。更に、ファイル部のバージョンアップ失敗というメッセージを出力する。図示はしないが、外部装置13にも同様にバージョンアップ失敗の表示がされているためサービスマンにも当然であるが知らせている。

【0069】図16に図13で示したステップS7, S8の詳細なブロック図を示す。

【0070】先ず、ステップS11で、失敗したブロックを判断し、ステップS12～15に対応した機能を選択し、ステップS16でその機能を選択できるキーを操作部から削除する。通常画面のソフトはブロック8の操作部共通に含まれている。

【0071】次に、図12に示すブロックのうち、ブロック8の操作部共通ソフトを書き換えを失敗した場合の

説明を行う。基本的動作は上記と同じ為説明は省略する。

【0072】さて、この場合の処理は、図13におけるステップS7及び8が異なる。そこで、この部分を図17のフローチャートに従って説明する。

【0073】操作部共通ソフトの書換を失敗した為、ステップS11へと進み、失敗したブロックの内容は全ての動作に関連したブロックかチェックする。一致しなければ、図16のステップS11へと進み対応キーを削除し、ステップS6へと進む。他方、一致した場合は22に進みソフトの実行をRAM502で行うように設定しステップS6へと戻る。

【0074】図18に装置全体を動作処理のフローチャートを示し、以下に説明する。

【0075】ステップS31では、ROM動作か否かを判定する。ROM動作が指定されていない場合、すなわち、通常動作を行う場合には、ステップS32へと進み、503フラッシュROM上のプログラムを実行する。ステップS33では、操作部でモードが設定され動作要求が発生したかをチェックする。動作要求が発生しない場合は、ステップS33で待つ事となる。

【0076】例えば、70%変倍のコピー5枚という設定が行われコピー動作要求が発生したとする。この場合には、ステップS34にて設定された条件にてコピー動作を行いステップS31へと戻る。

【0077】他方、ステップS31にて、図12で説明したようにROM動作が設定された場合にはステップS35に分岐し、EPROM502上のプログラムを実行する。前述したように本実施形態では、EPROM502には、複写動作に於ける、片面コピーのみとし、操作部もその機能だけをサポートするプログラムが搭載されている。次いで、ステップS36にて、複写動作要求が発生するのを待つ。発生したならば、ステップS37へと進み、複写動作を行いステップS31へと戻る。その時の操作部の表示画面を図19に示す。コピー一等倍片面コピーしかできない事がわかる。更に、ダウンロードが失敗した為最低機能で動作しているというメッセージを出力している。ダウンロードが失敗した事は、外部装置にも同様に表示されているためサービスマンにも当然であるが知らせている（図示せず）。

【0078】実施形態では、502EPROM上に複写動作最低機能を搭載しているがこれが、ファックスや、プリンタや、ファイルの最低機能であっても良い。

【0079】<第4の実施形態>第4の実施形態を説明する。図20は、第4の実施形態の構成を示すブロック図である。

【0080】図示において、先に説明した図1と同様の構成については同符号を付した。但し、本第4の実施形態における制御部400は画像形成装置100の動作制御、メモリの書き換え制御、データ制御通信装置と通信

する通信制御および圧縮されたデータを解凍するプログラムに基づく動作制御をする。また、901は、ホストコンピュータ900と画像形成装置100を結ぶ通信回路でありここではRS-232Cを用いる。

【0081】図21は、上記制御部400の詳細構成を示すブロック図である。図示においても図2と同様の構成には同符号を付した。従って、401は画像形成装置100の制御を行うCPUであり、402は制御プログラムおよび書き換えるデータの情報を記憶する電気的に書き換える可能な不揮発性メモリでここではフラッシュメモリであり、403は入力データの領域や作業用記憶領域として用いるRAMであり、404はフラッシュメモリ402を書き換えるためのプログラム（後述する各フローチャートに対応するプログラム）、圧縮されたデータプログラムを解凍するプログラムを記憶するROMであり、410はデータ制御通信装置9と通信を行うI/Oインターフェイスであり、408及び409はCPU401のアドレスバスおよびデータバスである。

【0082】このように構成された画像形成装置100とホストコンピュータ900において、本第4の実施形態では、ホストコンピュータ900は書き換えるデータプログラムを圧縮させ送信し、画像形成装置100はI/Oインターフェイス401を介してこれを受信し、制御部400のROM404の圧縮されたデータプログラムを解凍するプログラムに基づきプログラムを解凍し、制御部400のフラッシュメモリ402に解凍されたデータの書き換えを行う。

【0083】さらに、ホストコンピュータ900は書き換えるデータのデータ数、画像形成装置100においてかかる解凍時間等から、圧縮してデータの転送を行ったほうが書き換えの時間が早いか否かを判断し、その判断に基づく動作も行うことを付加する。ここで書き換えの時間というのはデータの転送、圧縮、解凍等を含む時間である。

【0084】尚、画像形成装置100の構造は、先の第1の実施形態で示した図3と同様であるものとし、ここでの説明は省略する。

【0085】さて、ホストコンピュータ900が持つ書き換えるデータと画像形成装置100のフラッシュメモリ402に記憶される書き換えるデータは本第4の実施形態においても16ブロックから成り立っている。前記フラッシュメモリ402はブロック単位で書き換えが可能であるので、本体側のデータとホスト側のデータを比較し、一致していないブロックだけ書き換えを行うことができる。こうした前提のもとで書き換えを行う場合、書き換えるブロック数が少なければ、書き換えるデータを圧縮せずそのまま画像形成装置100に転送したほうが書き換えにかかる時間の効率がよいこともある。よって書き換えるブロック数、データの通信時間および画像形成装置側でのデータの解凍時間を画像形成装置1

00とホストコンピュータ900で判断し、ホストコンピュータにデータを圧縮して転送するか否かの判断を加えることでより効果的なデータの書き換えを行うことができる。

【0086】次に図22のフローチャートを用いて動作を説明する。図22は圧縮してプログラムの転送を行うか否かを判断する際のホストコンピュータ900側のプログラムのフローチャートを示す。

【0087】まず、画像形成装置100に対し、画像形成装置内のフラッシュROMの全ブロック毎のチェックサムの送信命令を送信し（S401）、画像形成装置100からのチェックサムの受信を待つ（S402）。この通知を受信後、受信されたチェックサムよりどのブロックが変更すべきかを検出し、書き換えるブロック数およびプログラムのデータ量を算出する。その算出されたプログラムデータ量より圧縮、解凍にかかる時間およびプログラムデータを転送する時間を算出する（S403）。

【0088】ここでホストコンピュータ900はあらかじめ（プログラムデータをそのまま転送したときにかかる時間）／（プログラムデータ量）のデータを持っておりそのデータと前記算出した時間のデータの比較を行い、プログラムデータを書き換えるに当たって、プログラムデータを圧縮して転送した方が書き換えが速いか否かを判断する（S404）。そして、この判断で否と判断されれば、書き換え命令を画像形成装置100に送信し（S405）、プログラムデータに圧縮を施さずにそのままの形で画像形成装置に転送する（S406）。

【0089】一方、圧縮したデータを送信した方が早いと判断された場合には、圧縮転送命令を画像形成装置100に送信し（S407）、書き換えるプログラムデータを圧縮し（S408）、書き換え命令を画像形成装置に送信し（S409）、その圧縮したプログラムデータを画像形成装置に転送する（S410）。

【0090】次に図5のフローチャートを用いて画像形成装置側の動作を説明する。

【0091】まず、ホストコンピュータ900からのチェックサム送信命令を持ち（S510）、それを受信後フラッシュメモリ402に記憶されているプログラムデータの各ブロックのチェックサムをホストコンピュータ900に送信する（S502）。

【0092】次いで、ステップS503、S508で圧縮転送命令或いは書換え命令を受信するのを待つ。

【0093】ここで、圧縮転送命令を受信した場合には、次に書換え命令（どのブロック（複数可）に対する書換え命令かを示す情報も含まれる）を受信するのを待ち（ステップS504）、ステップS505で実際のデータの受信を待つ。データを受信したらステップS506で解凍処理を行って、指示されたブロックのプログラムコードを生成し、対応するブロックに書換える（ステ

ップS507)。

【0094】一方、圧縮転送命令を受信することなく、単なる書換え命令を受信した場合、処理はステップS508からステップS509に進み、その命令に含まれるブロック位置に受信したデータをそのまま書き込む処理を行う(ステップS510)。

【0095】<第5の実施形態>上記第4の実施形態では、ホストコンピュータ側で圧縮させるか否かを判定したが、本第5の実施形態では複数の画像形成装置が互いに接続されている場合を説明する。すなわち、1つの画像形成装置内のバージョンアップされたプログラムを、他の画像形成装置に反映させる例である。

【0096】この場合、システム構成は、図24に示す通りである。すなわち、画像形成装置500が上記第4の実施形態のホストコンピュータに対応し、画像形成装置100がプログラムを受信した自身のフラッシュROMを更新する。

【0097】通信手順であるが、送り手である画像形成装置500側の処理は、図25のフローチャートに従い、受けてある画像形成装置100側の処理は図26のフローチャートに示すこととする。図示の如く、送り手及び受け手の処理内容は、上記第4の実施形態と実質的に同じであるので、その説明は省略する。

【0098】本第5の実施形態によれば、複数の画像形成装置が接続された環境下にあった場合に、1つの画像形成装置に対して第4の実施形態で説明した処理でもって、内部の処理プログラムを書換えるだけで、他の画像形成装置が次々と自動的に自身のプログラムをアップデートさせることができることになる。

【0099】尚、本発明は、複数の機器(例えばホストコンピュータ、インターフェース機器、リーダ、プリンタ等)から構成されるシステムに適用しても、1つの機器からなる装置(例えば複写機、ファクシミリ等)に適用しても良い。

【0100】また、本発明の目的は、上述した実施形態の機能を実現するソフトウェアのプログラムコードを記憶した記憶媒体を、システム或いは装置に供給し、そのシステム或いは装置のコンピュータ(またはCPUやMPU)が記憶媒体に格納されたプログラムコードを読み出して実行することによっても、達成されることは言うまでもない。

【0101】この場合、記憶媒体から読み出されたプログラムコード自体が本発明の新規な機能を実現することになり、そのプログラムコードを記憶した記憶媒体は本発明を構成することになる。

【0102】プログラムコードを供給するための記憶媒体としては、例えばフロッピーディスク、ハードディスク、光ディスク、光磁気ディスク、CD-ROM、CD-R、磁気テープ、不揮発性のメモリカード、ROM等を用いることができる。

【0103】また、コンピュータが読み出したプログラムコードを実行することにより、前述した実施形態の機能が実現されるだけでなく、そのプログラムコードの指示に基づき、コンピュータ上で稼動しているOSなどが実際の処理の一部または全部を行ない、その処理によって実施形態の機能が実現される場合も含まれることは言うまでもない。

【0104】更に、記憶媒体から読み出されたプログラムコードが、コンピュータに挿入された拡張機能ボードやコンピュータに接続された機能拡張ユニットに備わるメモリに書き込まれた後、そのプログラムコードの指示に基づき、その機能拡張ボードや機能拡張ユニットに備わるCPUなどが実際の処理の一部または全部を行ない、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0105】

【発明の効果】以上説明したように本発明によれば、確実に動作することが約束されたプログラムでもって、その機能を向上させることができになる。

【0106】また、他の発明によれば、通信中に何等のトラブルが発生しても、そのトラブルの基になったプログラムの使用を積極的に不能にしつつ、基本的な処理動作を確保することができる。

【0107】また、更なる発明によれば、プログラムのアップデートにかかる時間を効率良く短縮することを可能ならしめる情報処理装置を提供しようとするものである。このため、以下の構成を備える。

【0108】

【図面の簡単な説明】

【図1】第1の実施形態における画像形成装置及びホストコンピュータの構成を説明するブロック図である。

【図2】実施形態における制御部の詳細構成を説明するブロック図である。

【図3】実施形態における画像形成装置の断面構成図である。

【図4】実施形態における操作部の構成を説明する平面図である。

【図5】第1の実施形態におけるホストコンピュータの実行手順を示すフローチャートである。

【図6】第1の実施形態における画像形成装置内の処理手順を示すフローチャートである。

【図7】第2の実施形態における画像形成装置内の動作手順を示すフローチャートである。

【図8】第3の実施形態における画像形成装置及びホストコンピュータとの関係を示す図である。

【図9】第3の実施形態におけるリーダ部1のブロック図である。

【図10】第3の実施形態におけるコア部10のブロック図である。

【図11】図10のメモリ部124の詳細を示したもの

である。

【図12】第3の実施形態におけるフラッシュROM内のプログラムの構成を示したものである。

【図13】第3の実施形態におけるプログラムの書換を行う手順を示すフローチャートである。

【図14】通常状態における操作部の表示画面の例を示す図である。

【図15】一部機能を不能になった状態の表示画面の例を示す図である。

【図16】図13におけるステップS7, S8の詳細を示すフローチャートである。

【図17】第3の実施形態における処理の一部を示すフローチャートである。

【図18】第3の実施形態における画像形成装置の全体の処理手順を示すフローチャートである。

【図19】第3の実施形態におけるダウンロード失敗時における表示画面の例を示す図である。

【図20】第4の実施形態の構成を示すブロック図である。

【図21】第4の実施形態における制御部の詳細構成を示すブロック図である。

【図22】第4の実施形態におけるホストコンピュータの処理内容を示すフローチャートである。

【図23】第4の実施形態における画像形成装置側の処理内容を示すフローチャートである。

【図24】第5の実施形態の構成を示すブロック図である。

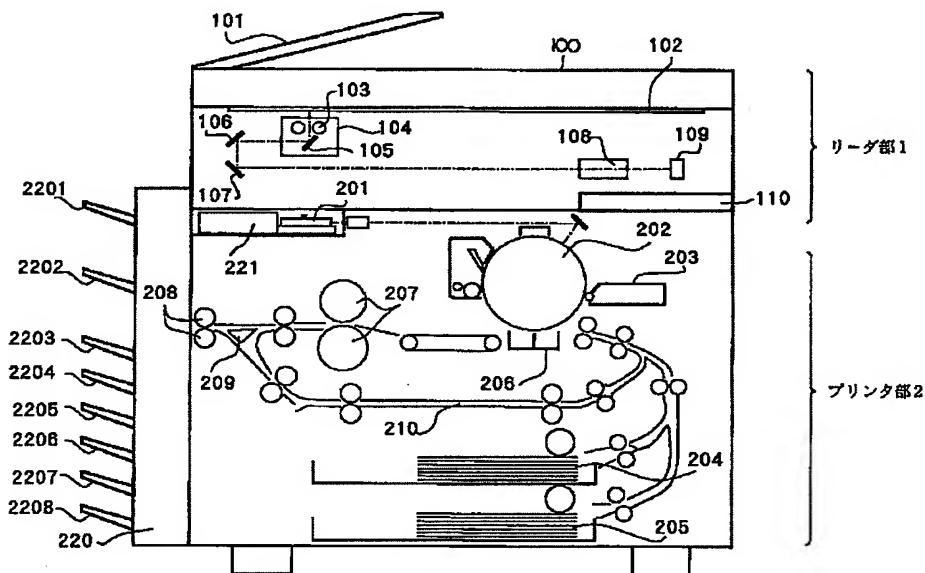
【図25】第5の実施形態におけるプログラム供給側の画像処理装置の処理内容を示すフローチャートである。

【図26】第5の実施形態におけるプログラム受け手側の画像形成装置側の処理内容を示すフローチャートである。

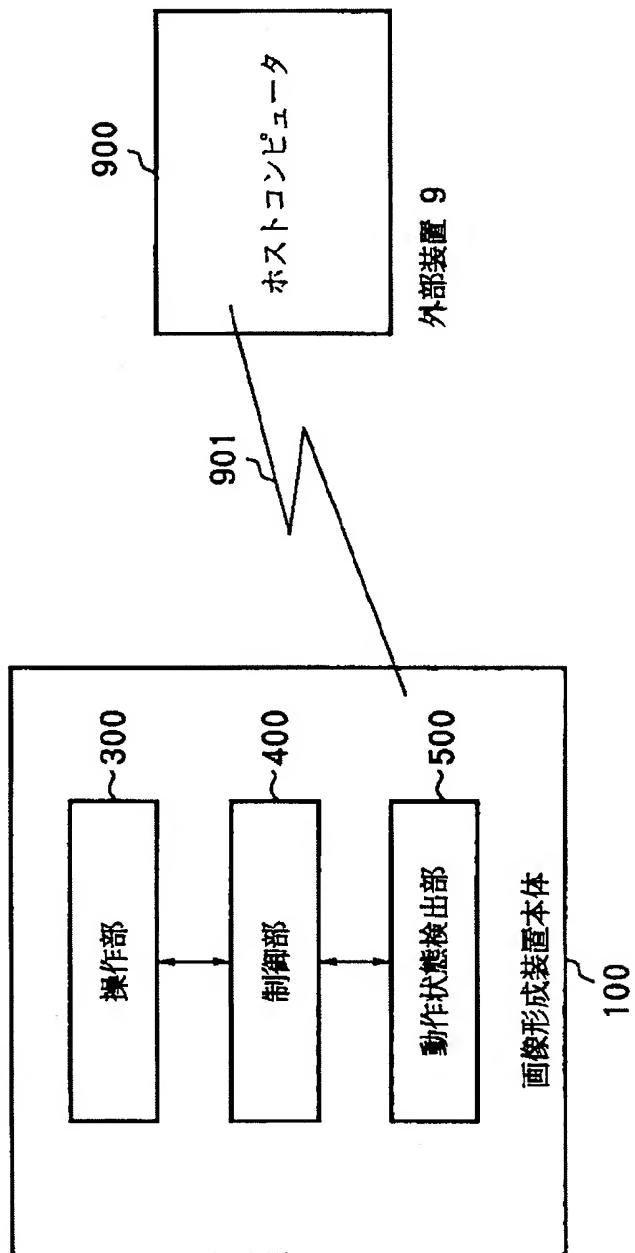
【符号の説明】

100	画像形成装置
300	操作部
400	制御部
401	CPU
402	フラッシュメモリ
403	RAM
404	ROM
410	I/Oインターフェース
900	ホストコンピュータ

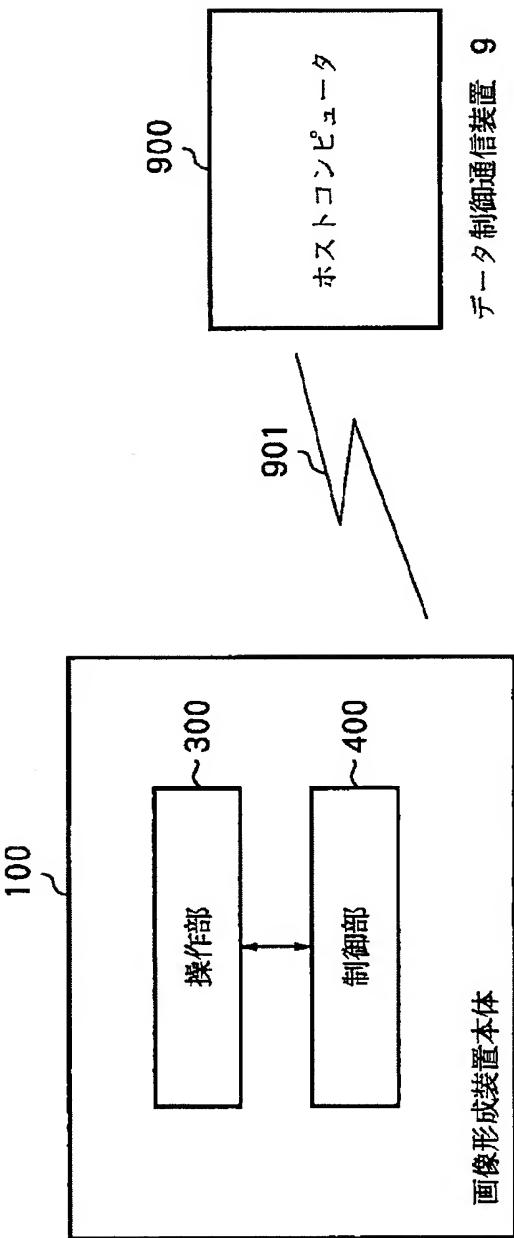
【図3】



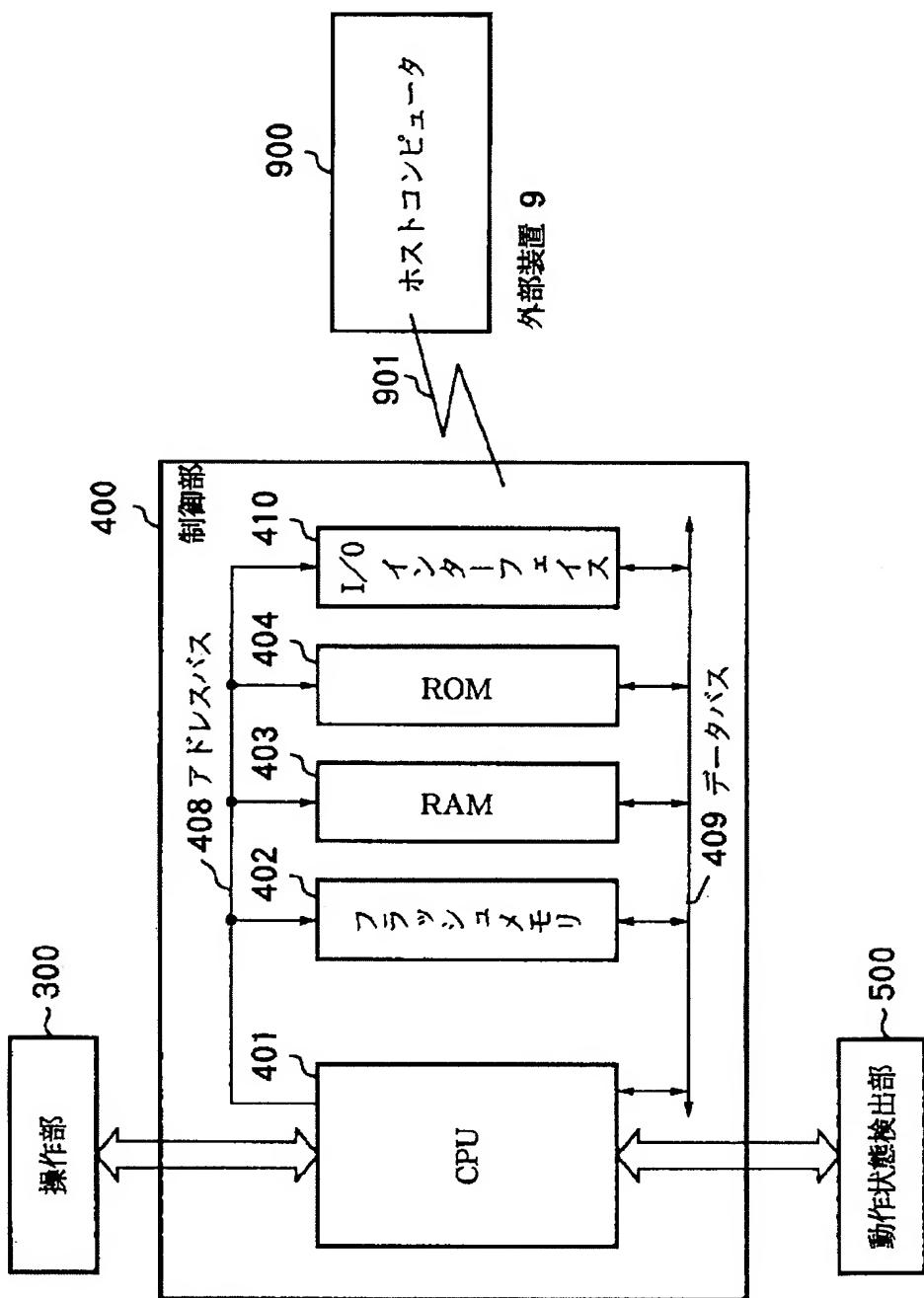
【図1】



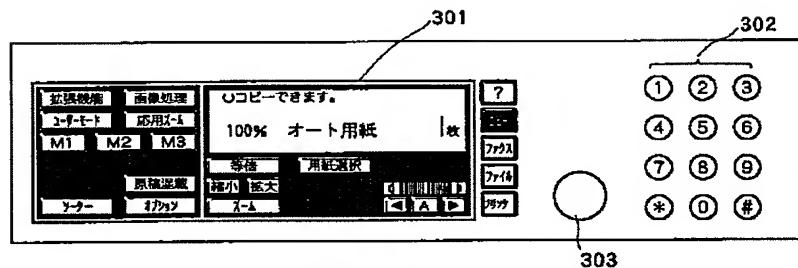
【図20】



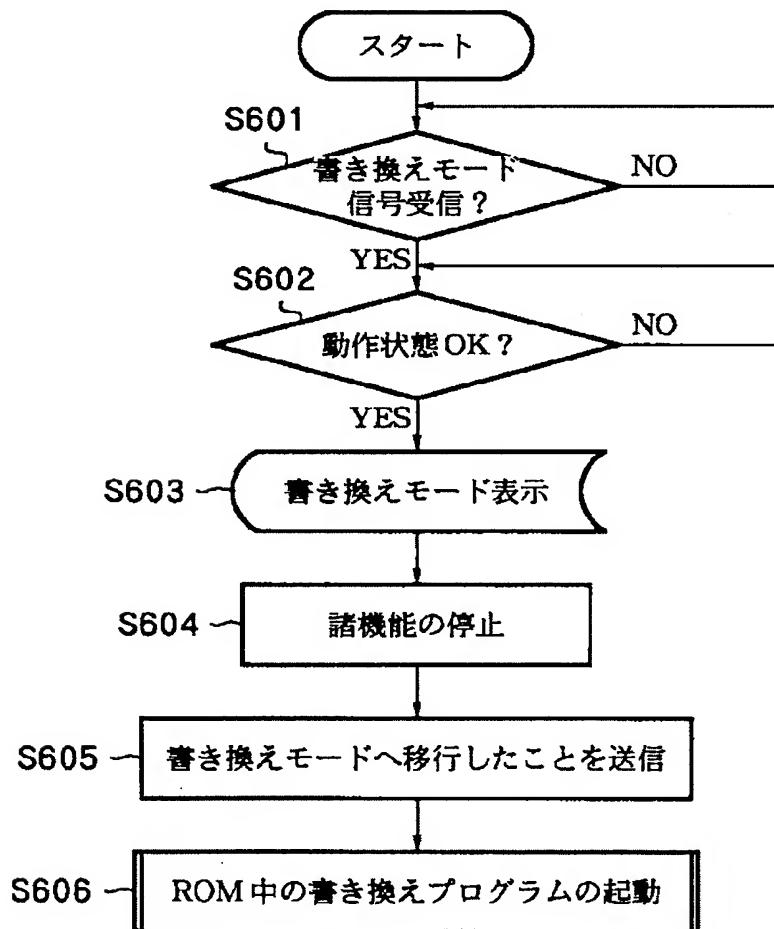
【図2】



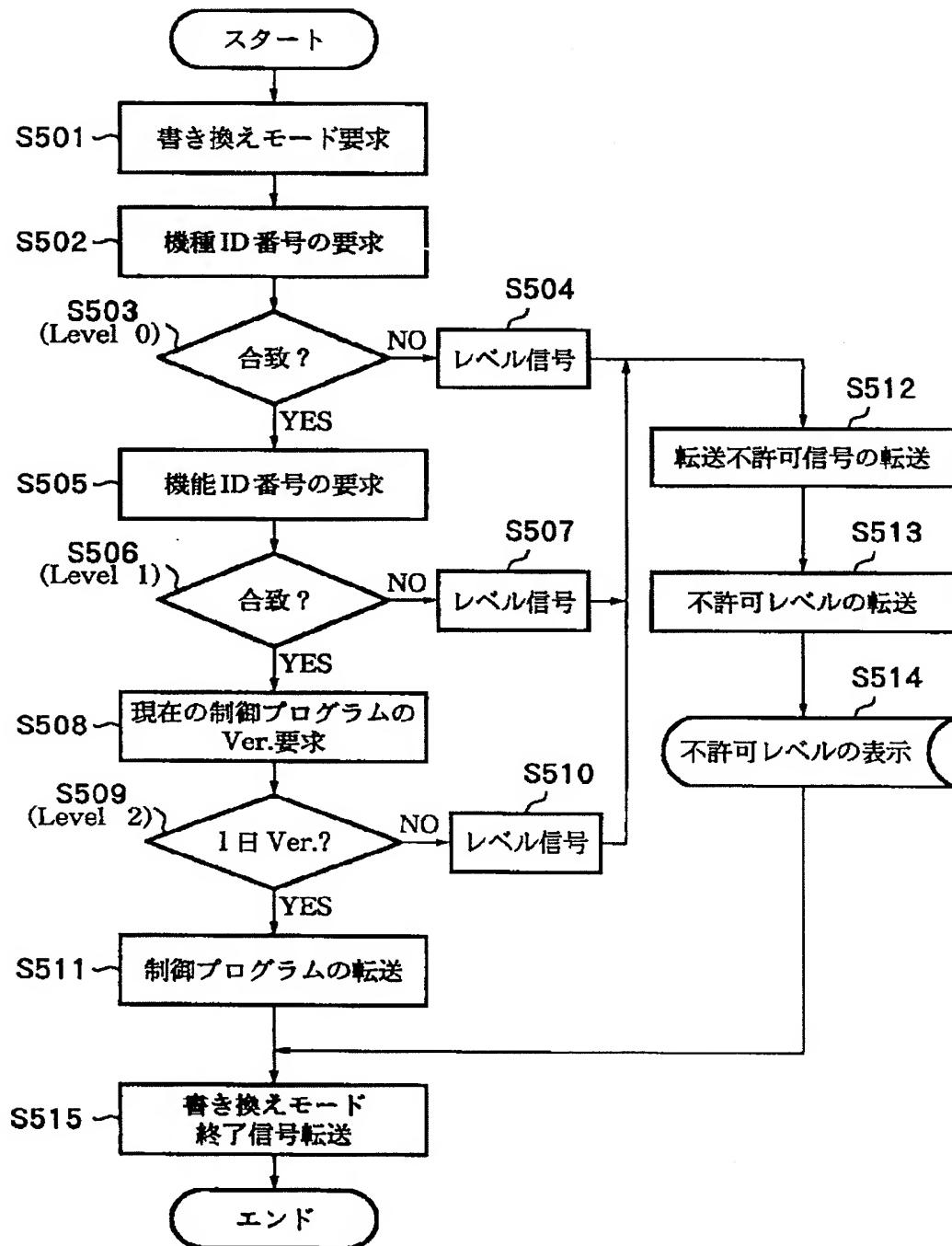
【図4】



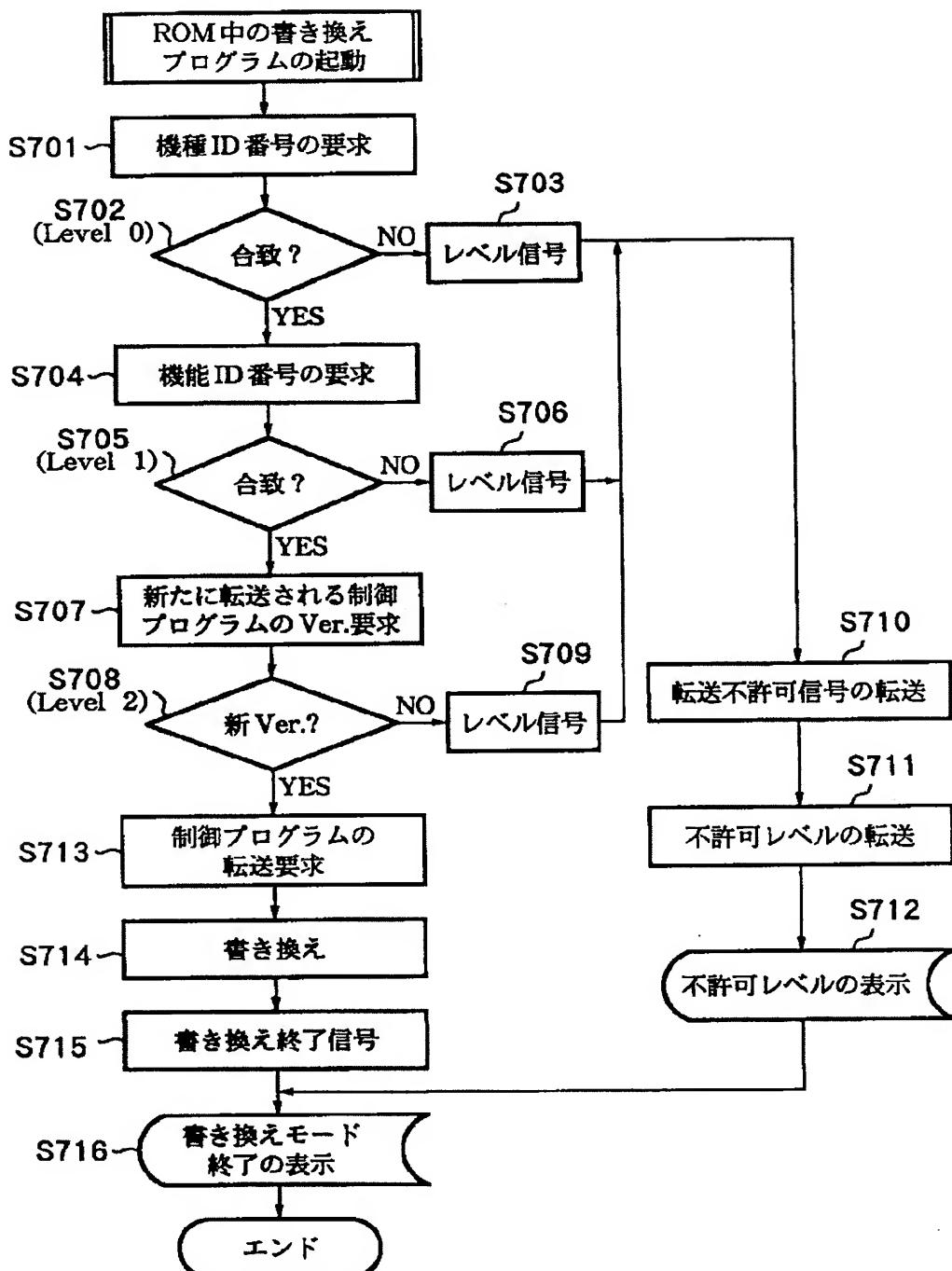
【図6】



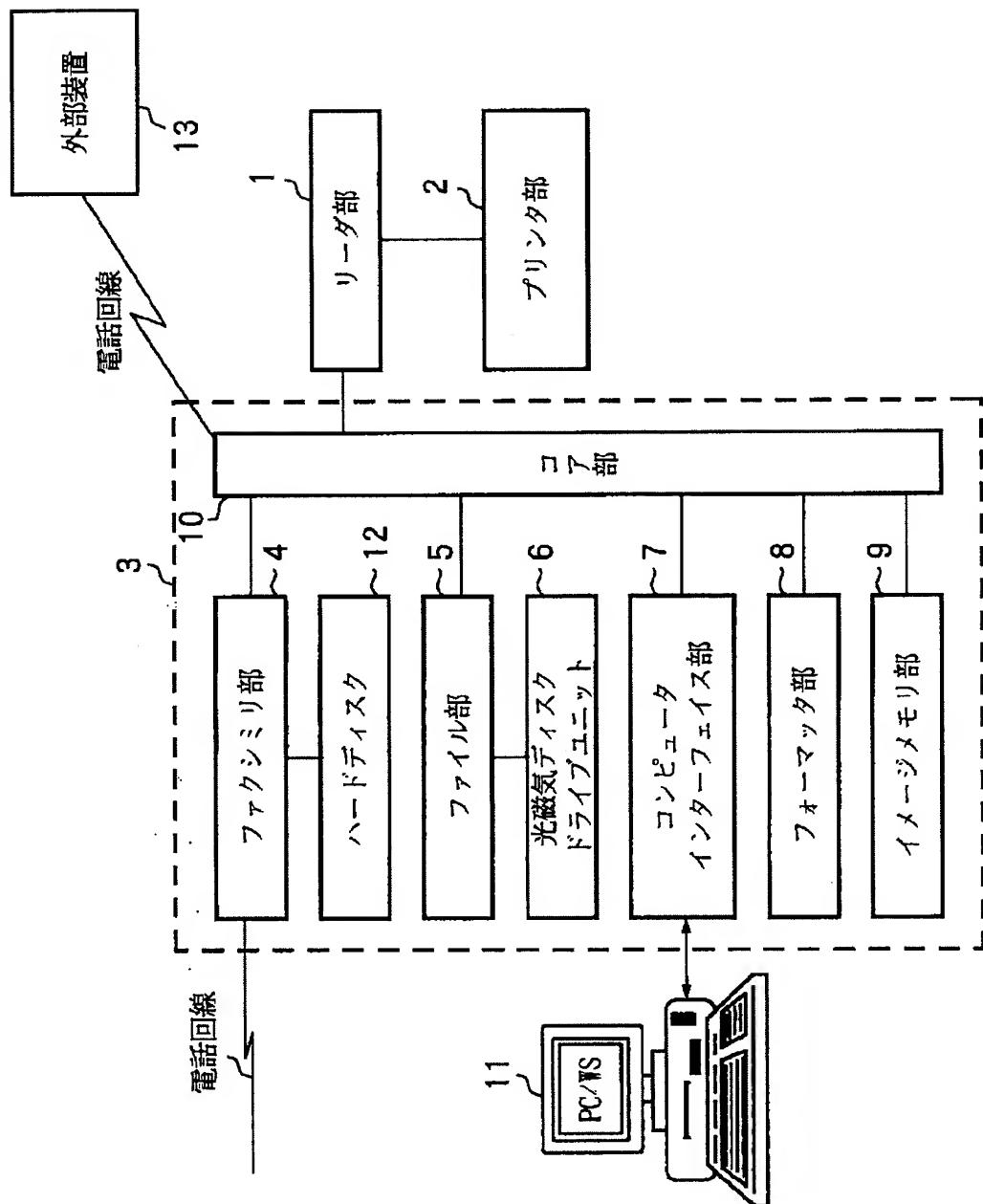
【図5】



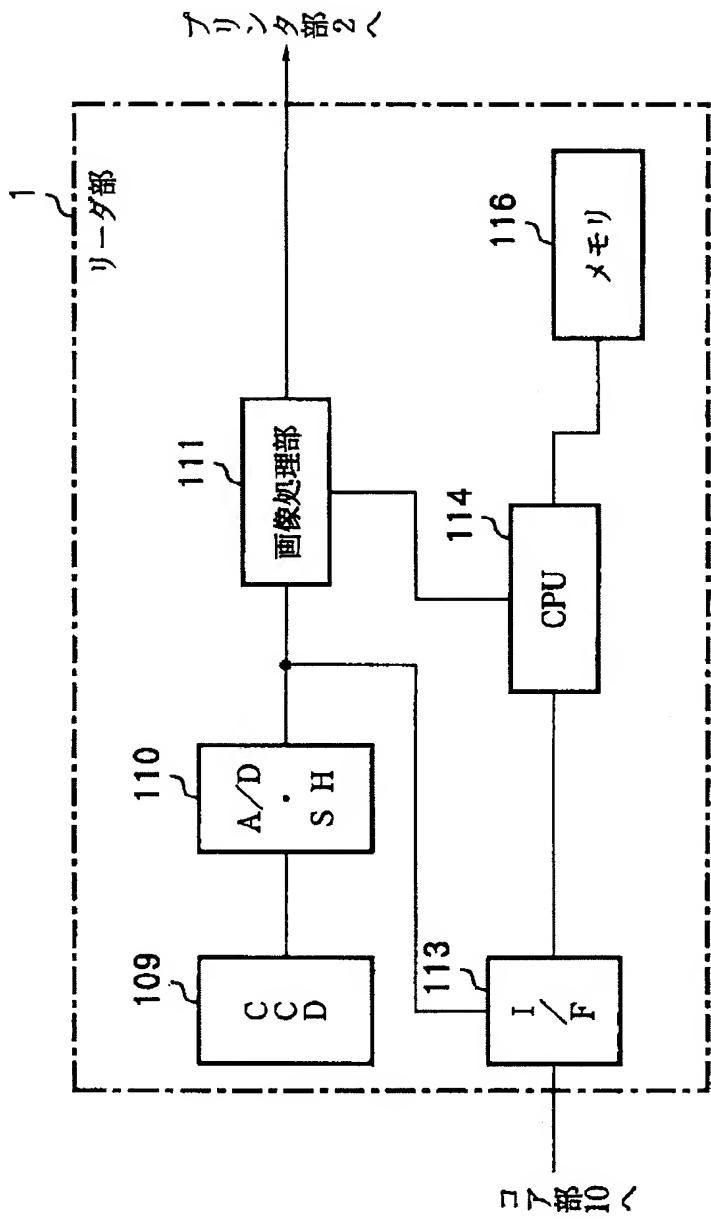
【図7】



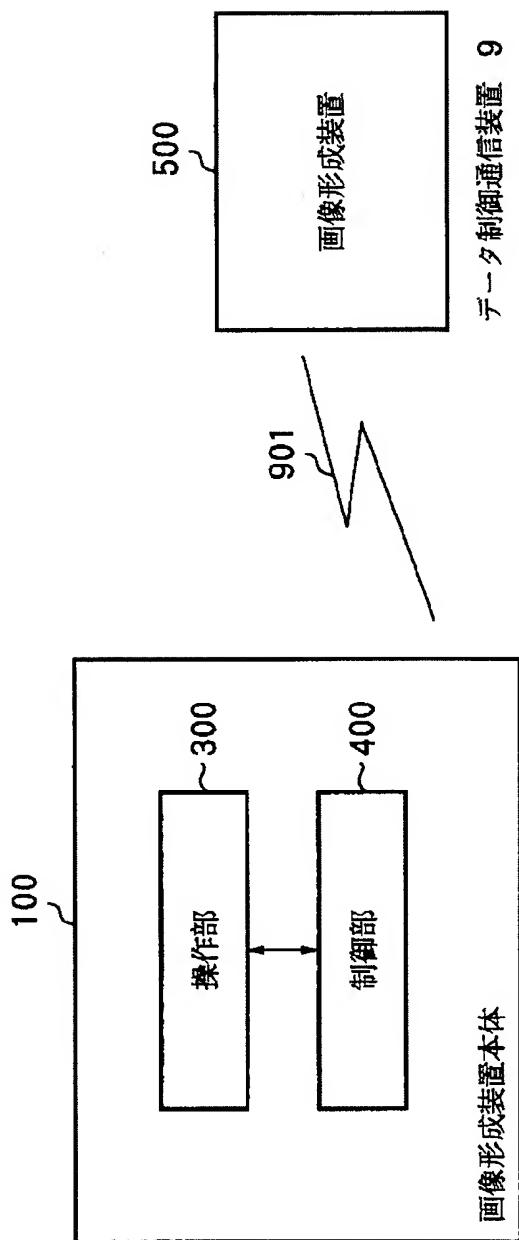
【図8】



【図9】

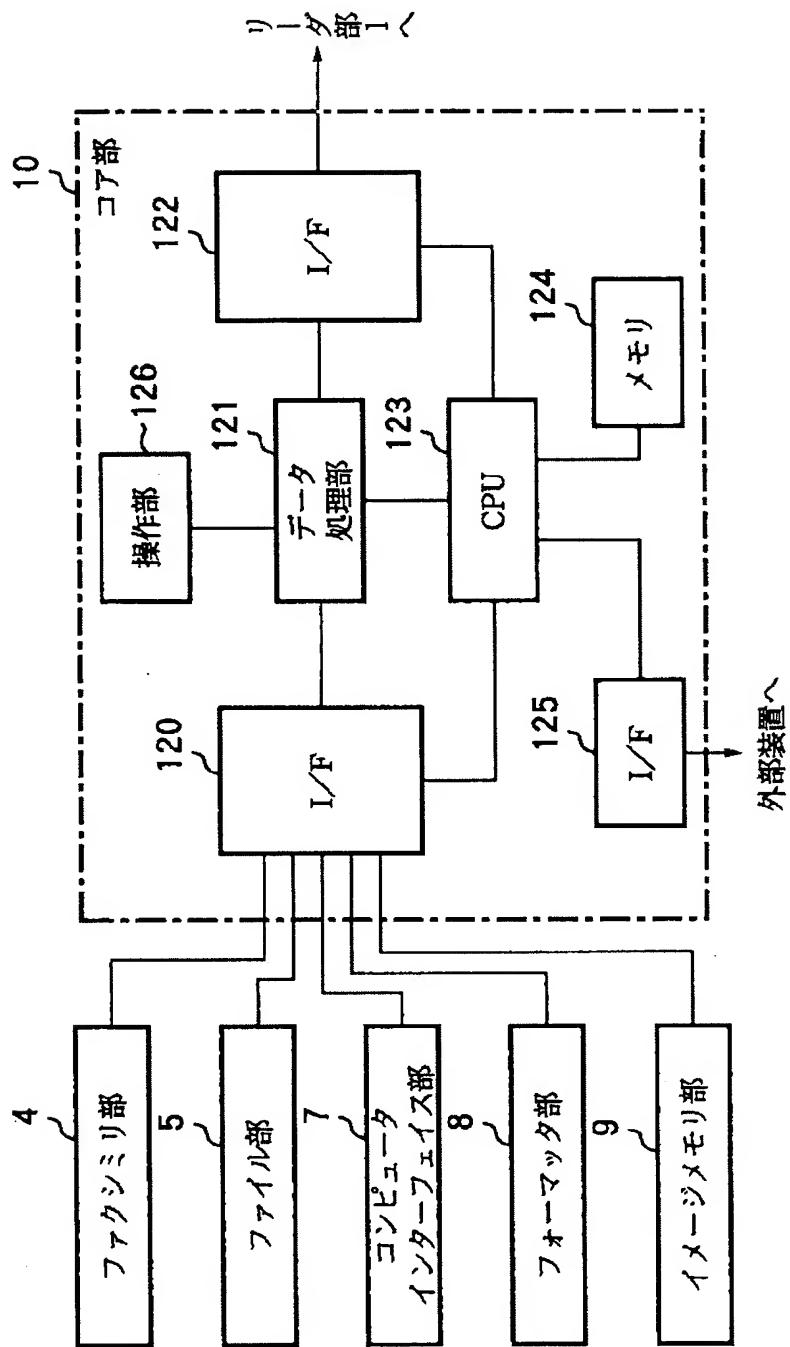


【図24】

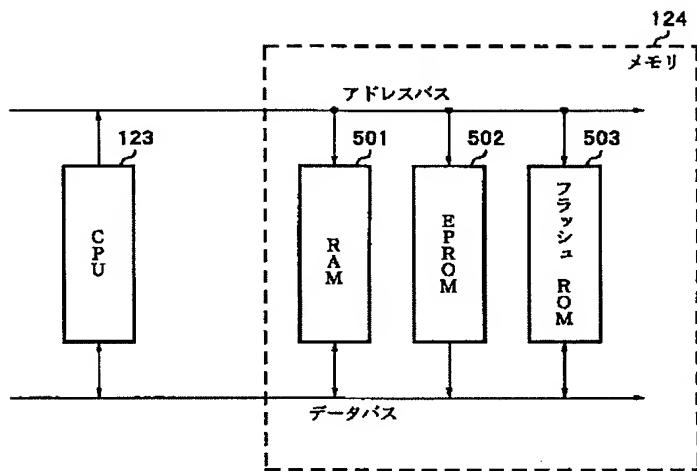


データ制御通信装置 9

【図10】



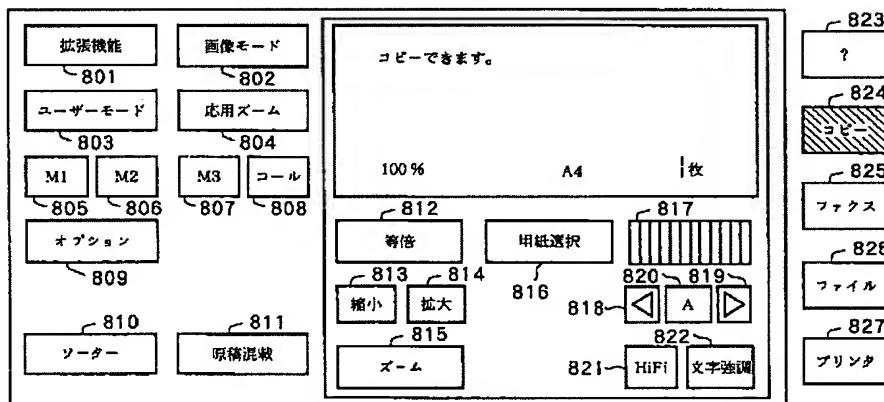
【図11】



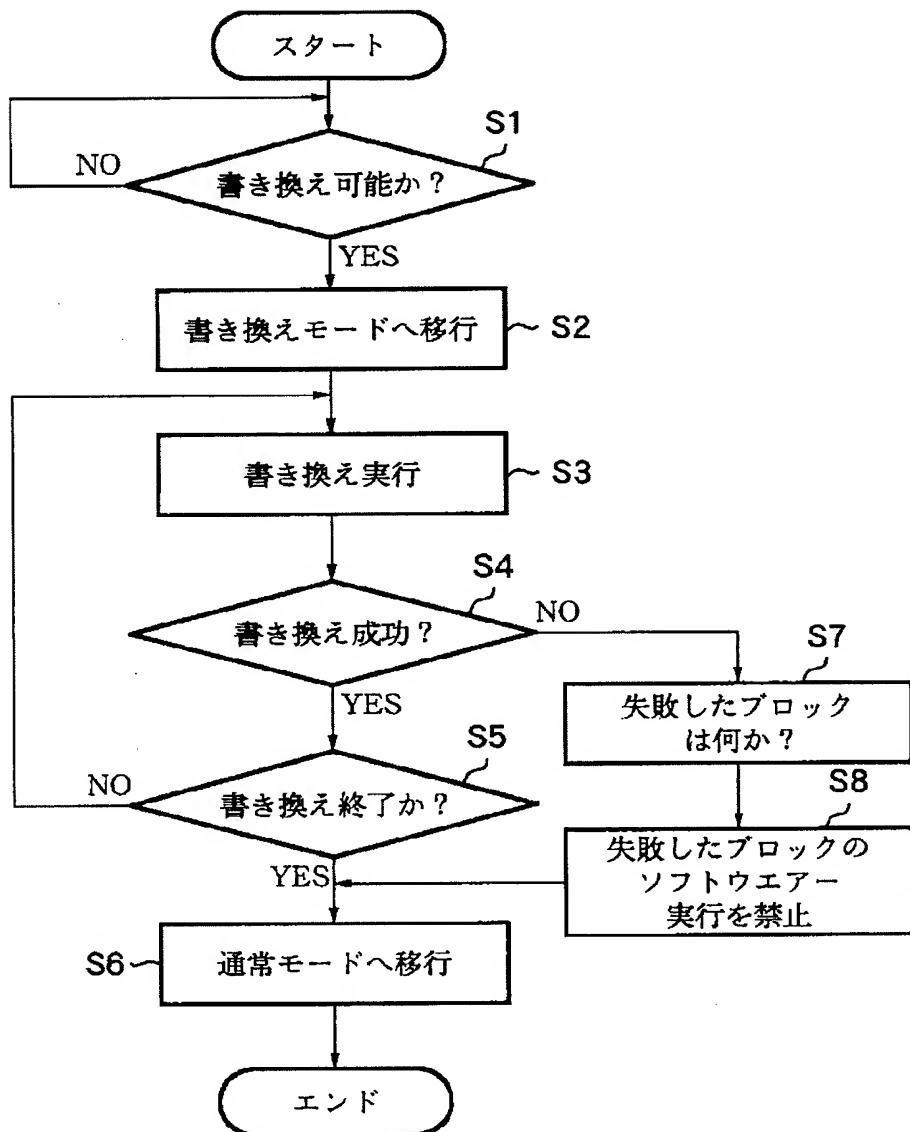
【図12】

ブロック0	書き換えプログラム	ブロック8	操作部共通
ブロック1	リード部I/F制御部	ブロック9	コピー操作部
ブロック2	データ処理部	ブロック10	ファクシミリ操作部
ブロック3	プリンタ制御部	ブロック11	ファイル操作部
ブロック4	FAX I/F 制御部	ブロック12	プリンタ操作部
ブロック5	File I/F 制御部	ブロック13	
ブロック6	コンピュータ I/F 制御部	ブロック14	
ブロック7	その他I/F 制御部	ブロック15	

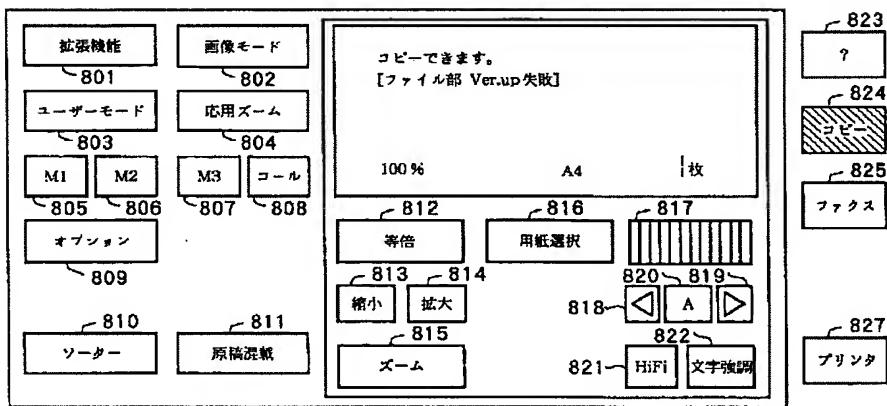
【図14】



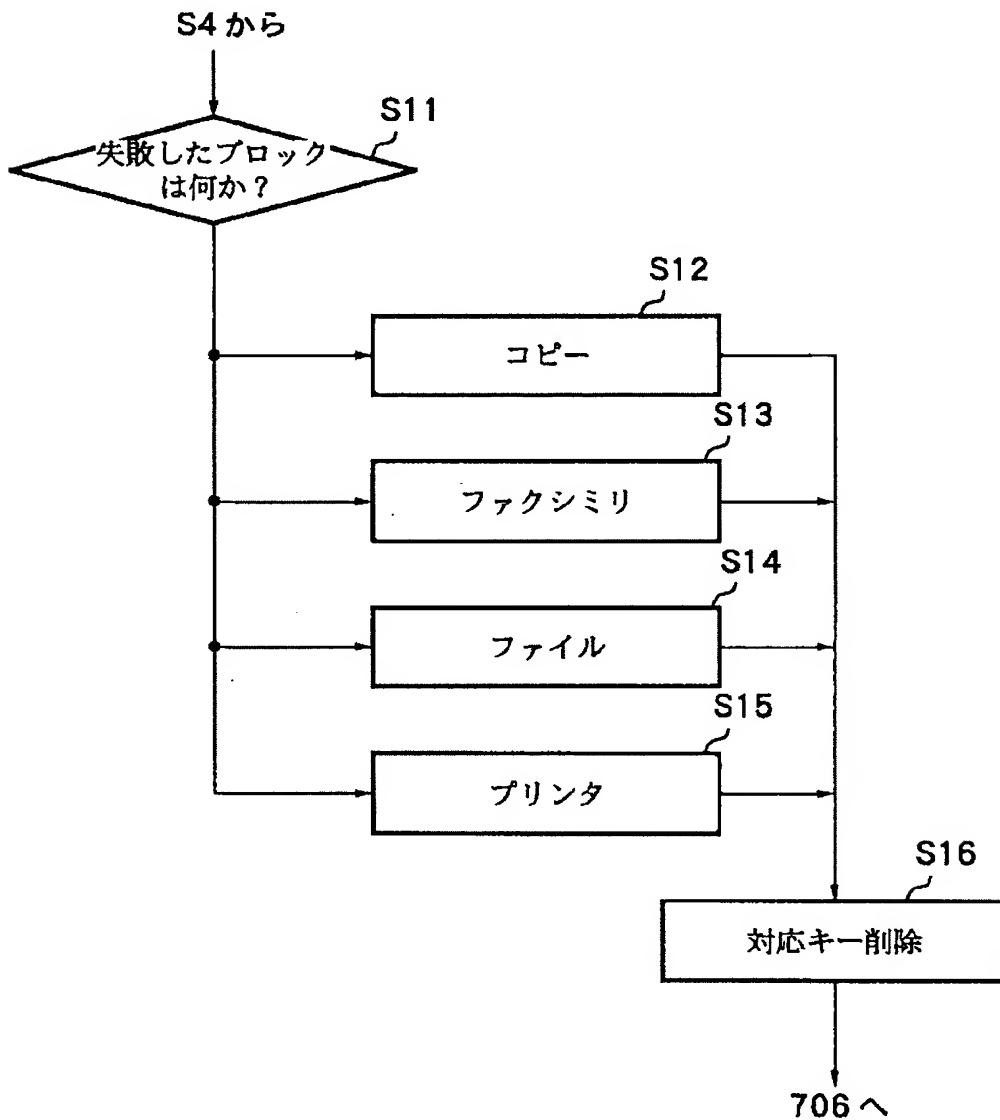
【図13】



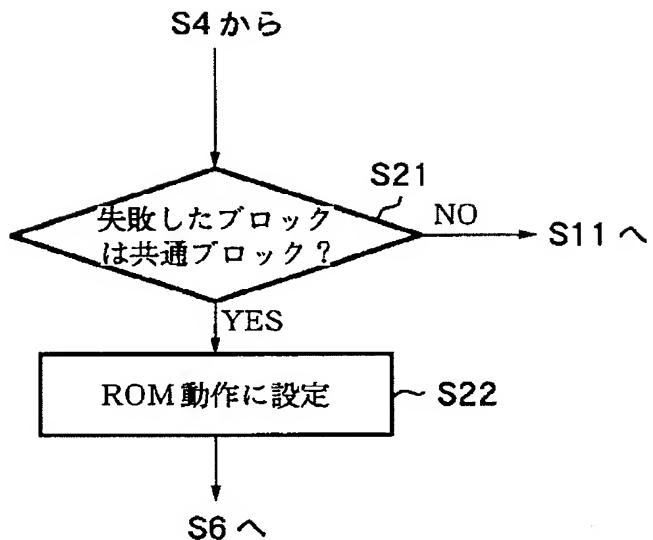
【図15】



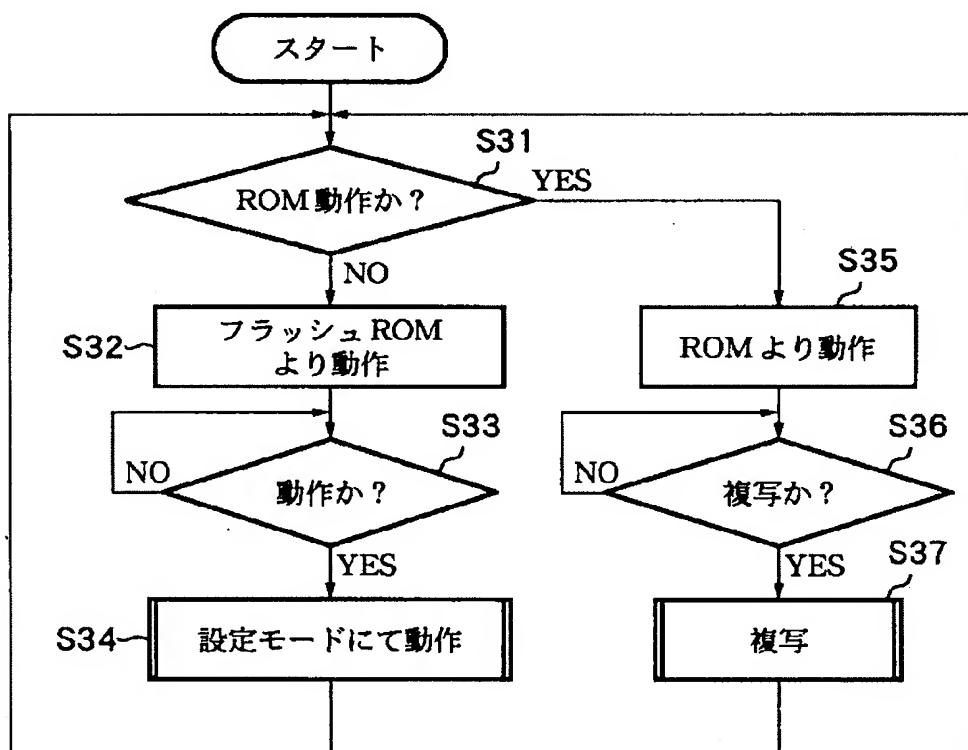
【図16】



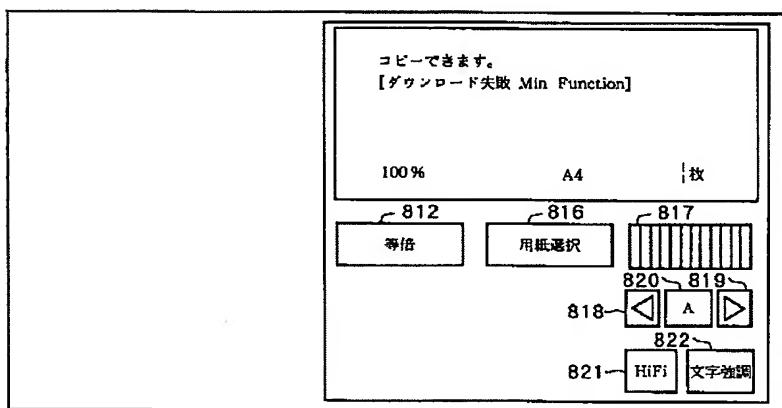
【図17】



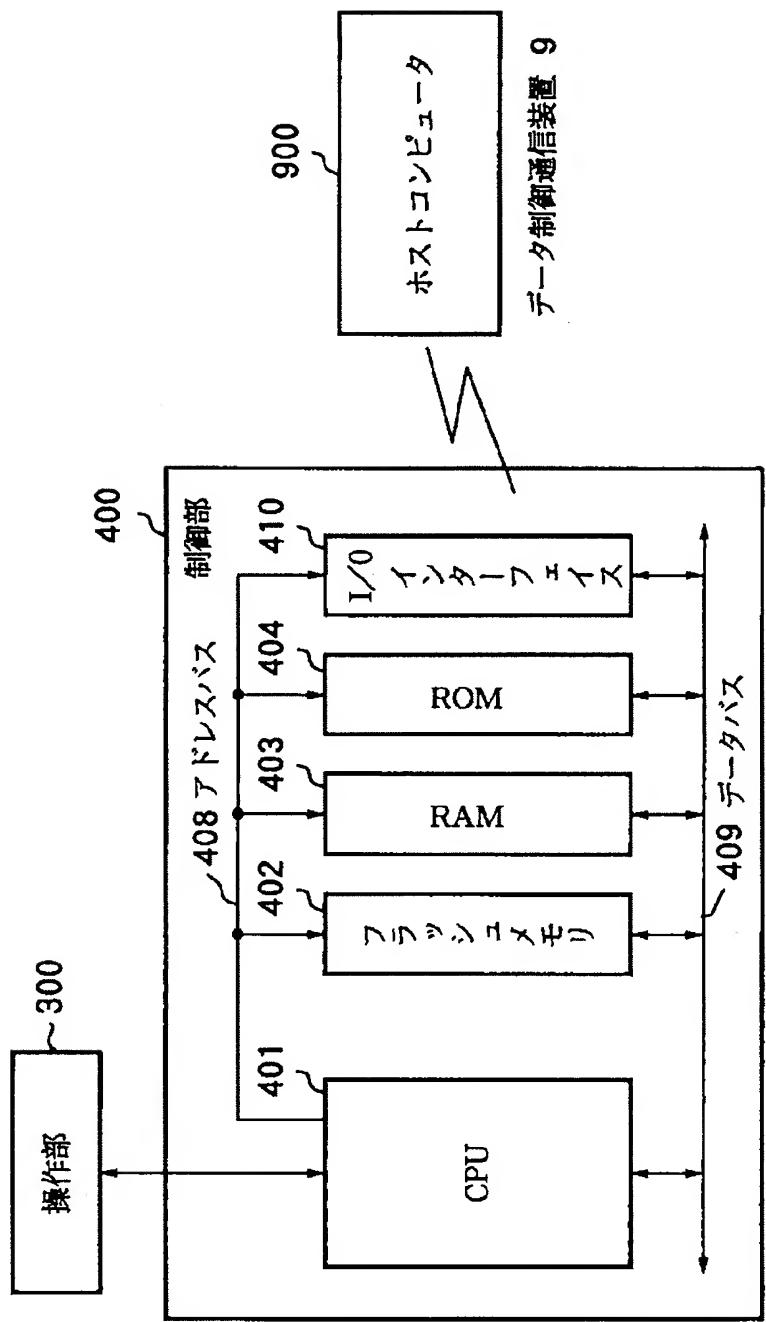
【図18】



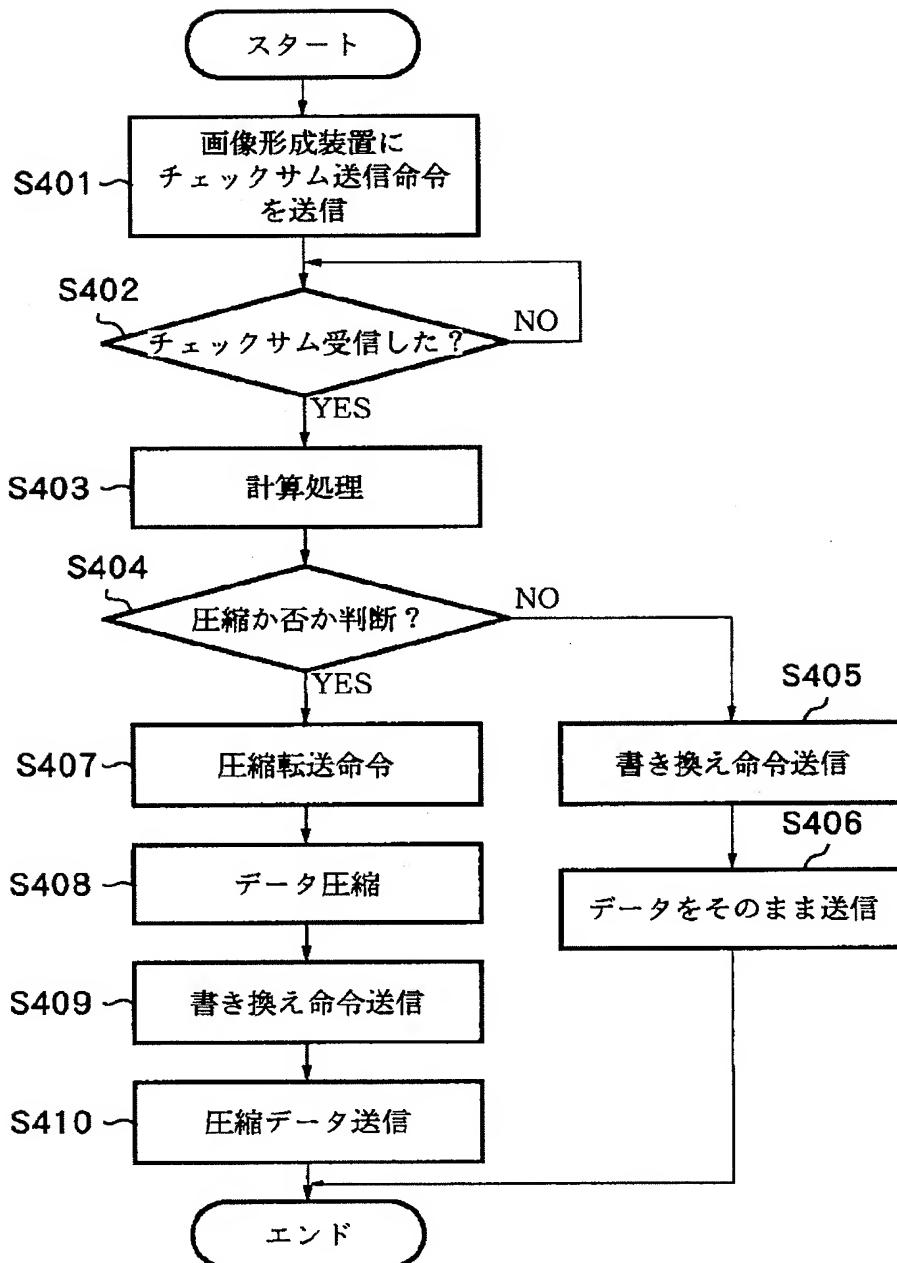
【図19】



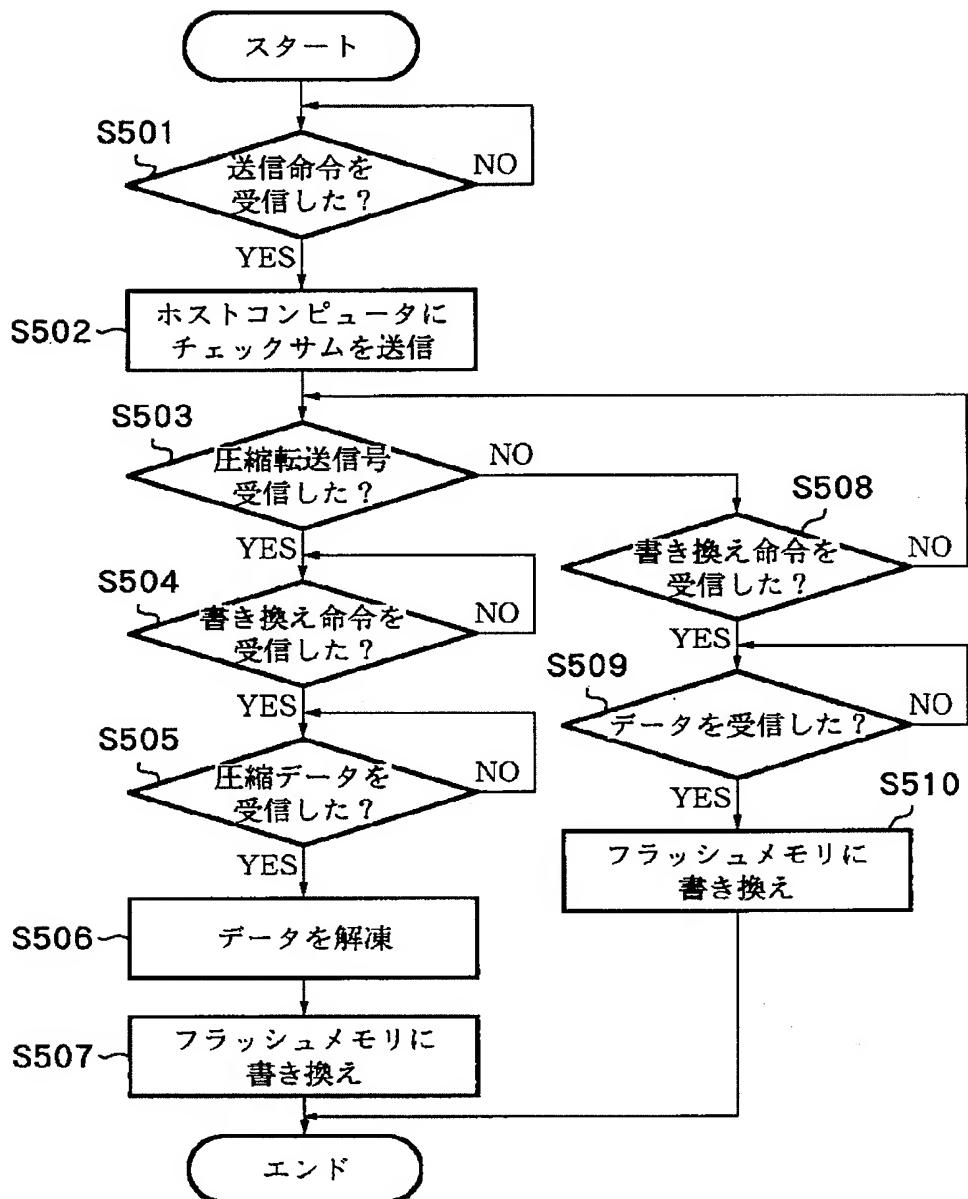
【図21】



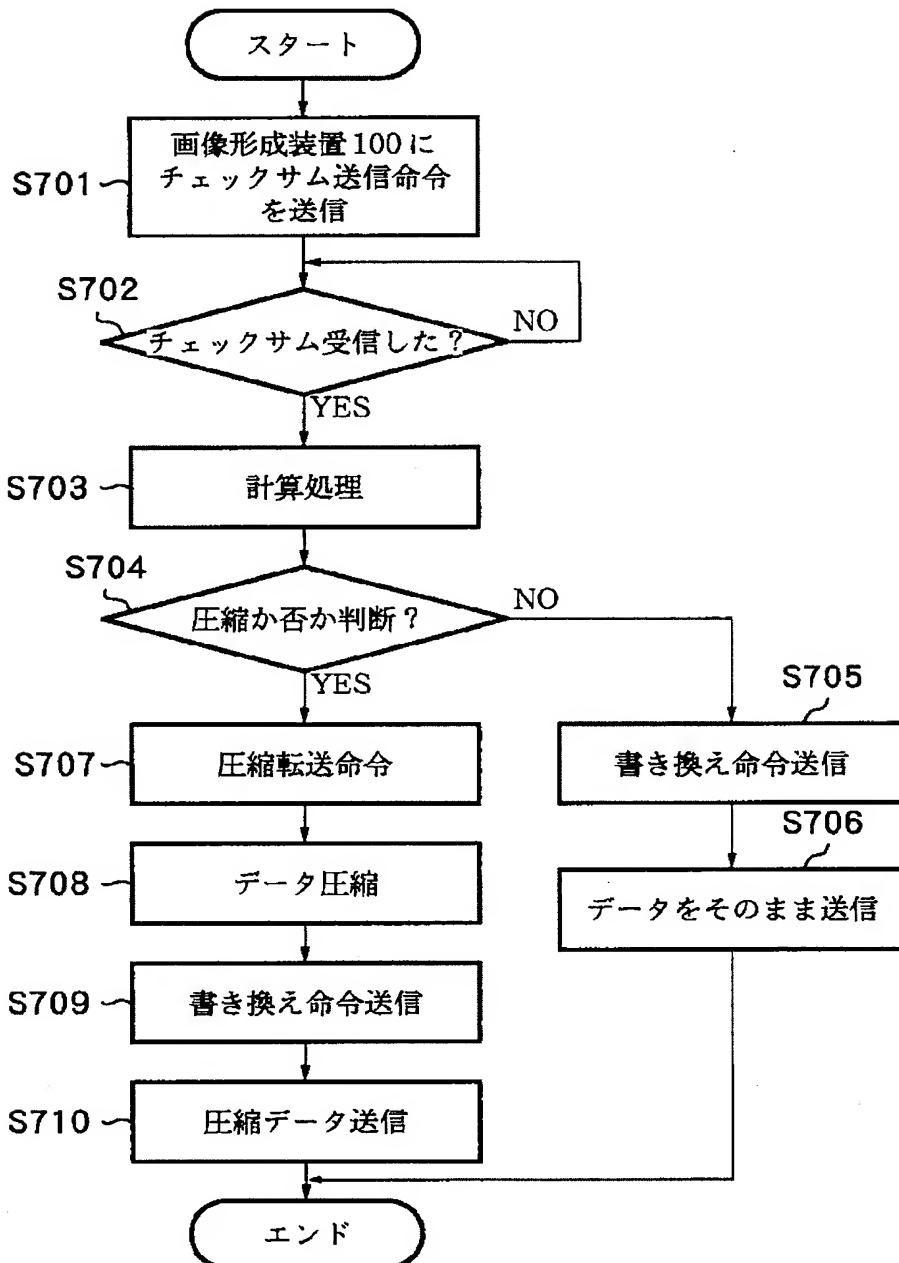
【図22】



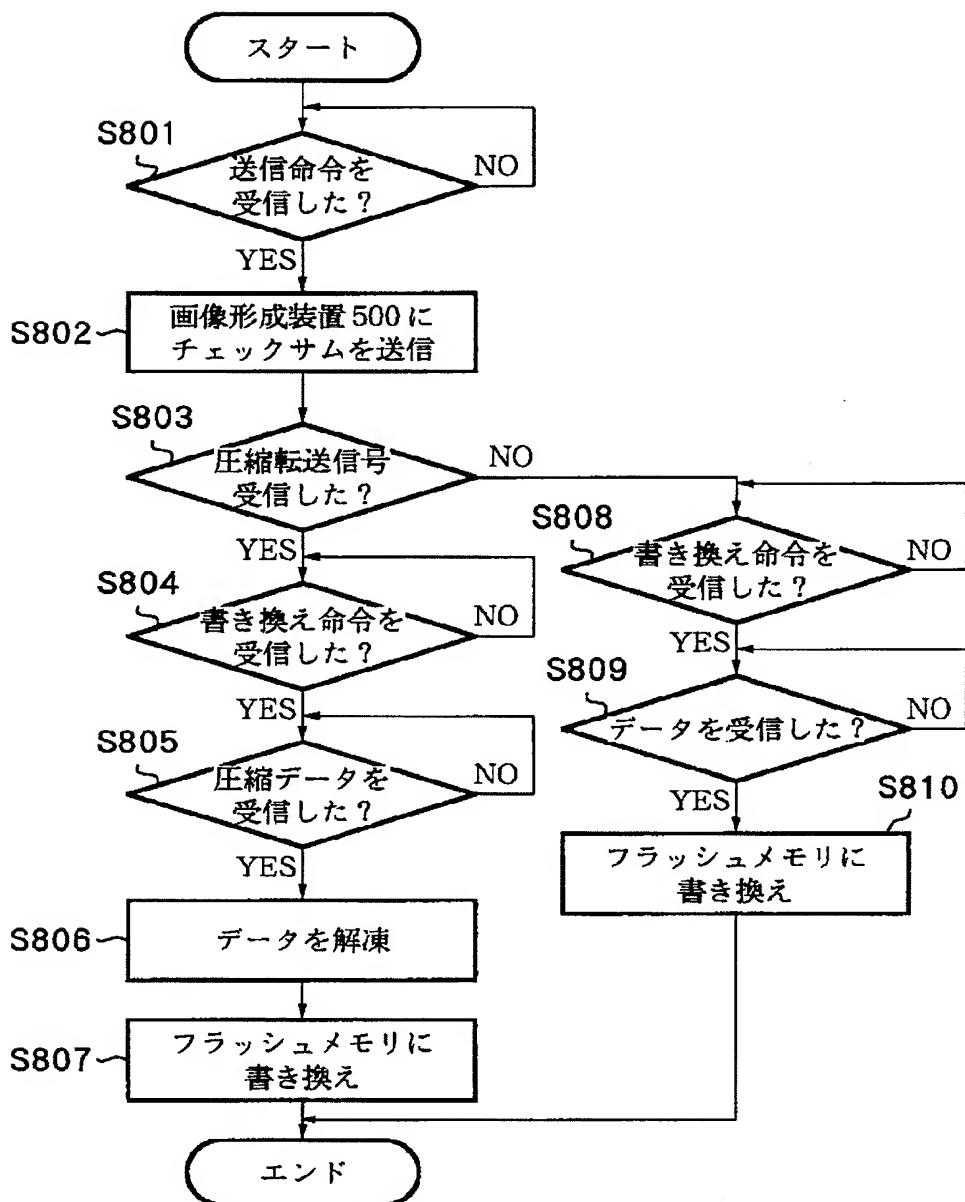
【図23】



【図25】



【図26】



フロントページの続き

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